P-A STACKS

December 1977 Number 400-Part I

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DEPARTMENT OF COMMERCE
UNITED STATES OF AMERICA

Solar-Geophysical Data prompt reports

Data for November 1977–October 1977

Explanation of Data Reports Issued as Number 390 (Supplement) February 1977

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ENVIRONMENTAL DATA SERVICE
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Solar - Geophysical Data

NO. 400 DECEMBER 1977

Part I (Prompt Reports)

DATA FOR
NOVEMBER 1977
OCTOBER 1977

NATIONAL GEOPHYSICAL AND SOLAR - TERRESTRIAL DATA CENTER
BOULDER, COLORADO

For obtaining bulletins on a data exchange basis, send request to: World Data Center A for Solar-Terrestrial Physics, NOAA, Boulder, Colorado 80302.

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SOLAR - GEOPHYSICAL DATA

No. 400

Issued in two parts

Helen E. Coffey, Editor

J. Virginia Lincoln, Director
Solar - Terrestrial Data Services Division

CONTENTS

Part I (Prompt Reports)

	Page
Index for 1976 and 1977	2
Data for November 1977	3-25
Data for October 1977	27-122

Part II (Comprehensive Reports)

Index for 1976 and 1977	2
Data for June 1977	3-38
Data for May 1977	39-49
Miscellaneous Data	51-71

Daily Solar Activity Centers
2 cm Spectroheliograms September 1977
8.6 mm Spectroheliograms September 1977

Solar Radio Waves
Spectral Observations Culgoora August 1977
Selected Solar Noise Bursts September 1977

Cosmic Rays
Sulphur Mountain, Calgary August - September 1977
Chart of Variations
Neutron Monitors Daily Values

Abbreviated Calendar Record
U.S.S.R. Aurora April 1977

INDEX FOR 1976 - 1977 DATA PUBLISHED IN "SOLAR-GEOPHYSICAL DATA"

		1977 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
A.	Solar and Interplanetary Phenomena	391A 34	392A 28	393A 34	394A 32	395A 36	396A 35	397A 32	398A 36	399A 34	400A 30	
A.1	Sunspot Drawings	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7	398A 7	399A 7	400A 7
A.2a	Zürich Provisional Relative Sunspot Numbers R_z											
A.2b	Zürich Final Sunspot Numbers R_z	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7	398A 7	399A 7	400A 7
A.2c	American Relative Sunspot Numbers R_A'	391A 34	392A 28	393A 34	394A 32	395A 36	396A 34	397A 32	398A 36	399A 34	400A 30	
A.3a	Mt. Wilson Magnetograms	391A 96	392A 84	393A 96	394A 92	395A 98	396A 94	397A 94	398A 98	399A 94	400A 92	
A.3b	Mt. Wilson Magnetic Characteristics of Sunspots	391A 34	392A 28	393A 34	394A 32	395A 36	396A 34	397A 32	398A 36	399A 34	400A 30	
A.3c	Kitt Peak Magnetograms	390A 21	391A 29	392A 21	393A 29	394A 27	395A 29	396A 29	397A 25	398A 29	399A 29	400A 24
A.3d	Mean Solar Magnetic Field (Stanford)	391A 34	392A 28	393A 34	394A 32	395A 36	396A 35	397A 32	398A 36	399A 34	400A 30	
A.4	$H\alpha$ Filtergrams	391A 34	392A 28	393A 34	394A 32	395A 36	396A 35	397A 32	398A 36	399A 34	400A 30	
A.5	Calcium Plage Drawings - McMath (or Catania)	391A 96	392A 84	393A 96	394A 92	395A 98	396A 94	397A 94	398A 98	399A 94	400A 92	
A.5a	Calcium Plage (McMath) and Sunspot Regions	391A101	392A 88	393A100	394A 96	395A104	396A 99	397A101	398A105	399A 99	400A 99	
A.5b	McMath Daily Calcium Plage Indices	391A 32	392A 26	393A 32	394A 30	395A 34	396A 32	397A 30	398A 34	399A 32	400A 28	
A.6	$H\alpha$ Synoptic Charts	395B 4	396B 4	397B 4	398B 4	399B 4	400B 4					
A.6b	Synoptic Chart and Active Regions (Paris)	390A 18	391A 22	392A 18	---	394A 21	---	396A 20	397A 19	398A 24	399A 24	400A 21
A.7f	Helium D3 Chromosphere (Big Bear)	390A 19	391A 23	392A 19	393A 23	394A 22	395A 24	396A 22	397A 20	398A 22	399A 23	400A 20
A.7g	Helium Synoptic Maps (KPNO)	391A 34	392A 28	393A 34	395B 36	395A 36	396A 34	397A 32	398A 36	399A 34	400A 30	
A.7h	Coronal Line Emission (Sac Peak)	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7	398A 7	399A 7	400A 7
A.8aa	2800 MHz - Daily Values of Solar Flux (ARO-Ottawa)	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7	398A 7	399A 7	400A 7
A.8ac	2800 MHz - Daily Values of Adj. Solar Flux (ARO-Ottawa)	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7	398A 7	399A 7	400A 7
A.8g	Daily Values of Adjusted Solar Flux (AFGL)	391A 34	392A 28	393A 34	394A 32	395A 36	396A 35	397A 32	398A 36	400B 57	400A 30	
A.9cb	8.6 mm Radio Maps of the Sun (NOSC - La Posta)	391A 34	392A 28	393A 34	394A 32	395A 36	396A 35	397A 32	398A 36	400B 52	400A 30	
A.9d	2 cm Radio Maps of the Sun (NOSC - La Posta)	390A 12	391A 13	392A 12	393A 13	394A 12	395A 14	396A 12	397A 13	398A 14	399A 14	400A 12
A.10a	169 MHz - Interferometric Observations (Nancay)	391B 43	391A 15	393B 35	393A 15	394A 14	395A 16	396A 14	397A 15	398A 16	399A 16	400A 14
A.10c	21 cm East-West Solar Scans (Fleurs)	391B 44	391A 16	393B 36	393A 16	394A 15	395A 17	396A 15	397A 16	398A 17	399A 17	400A 15
A.10d	43 cm East-West Solar Scans (Fleurs)	390A 13	391A 14	392A 13	393A 14	394A 13	395A 15	396A 13	397A 14	398A 15	399A 15	400A 13
A.10e	10.7 cm East-West Solar Scans (Ottawa-ARO)	390A 15	391A 19	392A 15	393A 20	394A 18	395A 21	396A 17	---	398A 25	399A 20	400A 17
A.11g	Solar X-ray (SMS/GOES)	391A 34	392A 28	393A 34	394A 32	395A 36	396A 34	397A 32	398A 36	399A 34	400A 30	
A.11h	Solar X-ray (OSO-8; 1975-057A)				398B 27							
A.11i	Solar X-ray (Columbia U.)	---	391A 25	---	393A 24	394A 23	395A 26	396A 24	397A 23	---	399A 26	---
A.12ba	Cosmic Ray Protons (Pioneers 6 & 7)	---	391A 27	---	393A 26	394A 24	395A 27	396A 25	---	---	399A 27	---
A.12bb	Cosmic Ray Protons (Pioneers 8 & 9)	395B 17	396B 20	397B 15	398B 22	399B 18	400B 34					
A.12e	Energetic Solar Particles (IMP H & J)	---	391A 25	---	393A 24	394A 23	395A 26	396A 24	397A 23	---	399A 26	---
A.13a	Solar Wind (Pioneers 6 & 7)	---	391A 27	---	393A 26	394A 24	395A 27	396A 25	---	---	399A 27	---
A.13ab	Solar Wind (Pioneers 8 & 9)	390A 24	391A 24	392A 23	393A 27	394A 25	395A 31	396A 27	397A 27	398A 27	399A 25	400A 25
A.13d	Solar Wind from IPS Measurements	395B 17	396B 19	397B 15	398B 21	399B 17	400B 33					
A.13e	Solar Plasma (IMP H & J)	---	---	---	---	---	395A 27	396A 25	---	---	---	---
A.17	Interplanetary Magnetic Field (Pioneer 8)	---	391A 27	---	393A 26	394A 24	---	396A 26	---	---	---	---
A.17	Interplanetary Magnetic Field (Pioneer 9)	390A 20	391A 28	392A 20	393A 28	394A 26	---	396A 28	397A 24	398A 28	400A 22	400A 22
A.17c	Inferred IP Magnetic Field	---	---	---	---	---	395A 27	396A 25	---	---	399A 27	---
A.18	Interplanetary Electric Field (Pioneer 8)	---	391A 27	---	393A 28	394A 24	---	396A 26	---	---	---	---
A.18	Interplanetary Electric Field (Pioneer 9)											
B.	Ionospheric (and Radio Wave Propagation) Phenomena	391A118	392A104	393A122	394A118	395A122	396A118	397A120	398A124	399A128	400A 120	
B.52	Graphs of Transmission Frequency Range	391A120	392A103	393A121	394A120	395A124	396A120	397A122	398A126	399A127	400A 122	
B.53	Quality Figures Based on Frequency Ranges											
C.	Flare-Associated Events	390A 10	391A 11	392A 10	393A 10	394A 10	395A 10	396A 10	397A 10	398A 10	399A 10	400A 10
C.1a	Optical Observations Flares	395B 8	396B 8	397B 8	398B 8	399B 8	400B 8					
C.1ba	Optical Observations Flares (Standardized Data)	390A 11	391A 12	392A 11	393A 12	394A 11	395A 13	396A 11	397A 12	398A 13	399A 13	400A 11
C.1d	Flare Patrol Observations	395B 13	396B 13	397B 11	398B 14	399B 13	400B 19					
C.1d	Flare Patrol Observations	395B 12	396B 12	397B 10	398B 13	399B 12	400B 18					
C.1e	Flare Indices (by day)	396B 35	397B 31	398B 41	399B 33	400B 49						
C.1f	Flare Indices (by Region)	395B 14	396B 14	397B 12	398B 15	399B 14	400B 20					
C.3	Solar Radio Waves - Outstanding Occurrences	390A 14	391A 17	392A 14	393A 17	394A 16	395A 18	396A 16	397A 17	398A 18	399A 18	400A 16
	Solar Radio Waves - Fixed Frequencies - Selected	393B 40	393B 41	393A108	394A105	396B 41	398B 44	398B 46	399B 36	399A113		
C.3t	43.25, 80 and 160 MHz Selected Bursts (Culgoora)	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103	398A107	399A102	400A 101	
C.4a	Solar Radio Spectral Obs. (Fort Davis)	---	---	---	---	---	---	---	---	---	---	
C.4b	Solar Radio Spectral Obs. (Boulder)	391A103	393B 37	393A102	394A 98	396B 38	397B 34	397A103		399A102		
C.4d	Solar Radio Spectral Obs. (Culgoora)	391A103	392A 90	393A102	394A 98	395A106	397B 34	397A103	398A107	399A102	400A 101	
C.4e	Solar Radio Spectral Obs. (Weissenau)	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103	398A107	399A102	400A 101	
C.4f	Solar Radio Spectral Obs. (Sagamore Hill)	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103	398A107	399A102	400A 101	
C.4h	Solar Radio Spectral Obs. (Dwingeloo)	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103	398A107	399A102	400A 101	
C.4i	Solar Radio Spectral Obs. (Dürnten)	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103		399A102	400A 101	
C.4j	Solar Radio Spectral Obs. (Manila)	390A 17	391A 21	392A 17	393A 22	394A 20	395A 21	396A 17	397A 22	399B 37	399A 22	400A 19
C.5e	Solar X-ray (SMS/GOES)				398B 27							
C.5f	Solar X-ray (Columbia U.)	391A102	392A 89	393A101	394A 97	395A105	396A100	397A102	398A106	399A100	400A 100	
C.6	Sudden Ionospheric Disturbances											
D.	Geomagnetic and Magnetospheric Phenomena	391A114	392A 97	393A114	394A111	395A115	397B 39	397A114	398A117	399A120	400A 113	
D.1a	Geomagnetic Indices Kp, Kn, Ks, Km, Ap, aa, Cp	391A116	392A 99	393A116	394A113	395A117	396A113	397A116	398A119	399A122	400A 115	
D.1ba	27-day Chart of Kp Indices											
D.1c	27-day Chart of C9	391A117	392A101	393A119	394A116	395A120	396A116	397A119	398A122	399A125	400A 118	
D.1d	Principal Magnetic Storms					---						
D.1e	Reduced Magnetograms	392B 38	392A102	393A120	394A117	395A121	396A117	398B 47	398A123	399A126	400A 119	
D.1f	Sudden Commencement and Solar Flare Effects		392A100	393A118	394A115	395A119	396A115	397A118	398A121	399A124	400A 117	
D.1g	Equatorial Indices Dst											
F.	Cosmic Rays	391A109	393B 44	393A109	394A110	395A114	396A110	397A109	398A116	399A115	400A 112	
F.1a	Cosmic Ray Neutron Counts (Deep River)	391A109	392A 96	393A109	394A110	395A114	396A110	397A109	398A116	399A115	400A 112	
F.1b	Cosmic Ray Neutron Counts (Climax)	391A109	393B 44	393A109	394A110	395A114	396A110	397A109	398A116	399A115	400A 112	
F.1e	Cosmic Ray Neutron Counts (Alert)	393B 44	394B 36	394B 36	394A110	395A114	396A110	397A109	400B 70	400B 70		
F.1f	Cosmic Ray Neutron Counts (Calgary)	393B 44	394B 36	394B 36	394A110	395A114	396A110	397A109	400B 70	---		
F.1g	Cosmic Ray Neutron Counts (Sulphur Mountain)											
F.1h	Cosmic Ray Neutron Counts (Thule)	391A109	392A 96	393A109	394A110	395A114	396A110	397A109	398A116	399A115	400A 112	
F.1i	Cosmic Ray Neutron Counts (Kiel)	391A109	392A 96	393A109	394A110	395A114	396A110	397A109	398A116	399A115	400A 112	
F.1j	Cosmic Ray Neutron Counts (Tokyo)					395A114	396A110	397A109	398A116			
F.1k	Cosmic Ray Neutron Counts (Kula)											
H.	Miscellaneous	390A 4	391A 5	392A 5	393A 5	394A 5	395A 4	396A 5	397A 4	398A 4	399A 4	400A 4
H.60	IUWDS Alert Decisions	396B 28	397B 24	398B 34	399B 26	400B 42						
H.62	Abbreviated Calendar Record											

Note: A = Part I, B = Part II.

386A 22 listed under 1976 Aug shows that data for August 1976 were contained in *Solar-Geophysical Data* Number 386 - Part I beginning on page 22.

NOVEMBER 1977 DATA

Contents

	Page
Alert Period	
IUWDS Alert Periods (Advance and Worldwide)	4-5
Daily Solar Indices	
12-Month Tables Sunspot Numbers, R_z, and 2800 MHz Flux Adjusted to 1 A.U.	6
Combined Table Sunspot Numbers and Solar Fluxes	7
Graph of Sunspot Cycles	8
Zürich Smoothed Observed and Predicted Sunspot Numbers	9
Solar Flares	
Hα Solar Flares	10
No-Flare-Patrol Chart	11
Solar Radio Waves	
169 MHz Solar Interferometric Chart - Nancay	12
10.7 cm East-West Solar Scans - ARO, Ottawa	13
21 cm East-West Solar Scans - Fleurs	14
43 cm East-West Solar Scans - Fleurs	15
Selected Fixed-Frequency Occurrences	16
Solar X-ray Radiation	
SMS-2 GOES	17-19
Coronal Holes	
Helium 10830 Å Synoptic Map	20
Helium D3 Chromosphere	21
Spacecraft Observations	
No spacecraft observations.	
Inferred IP Magnetic Field Polarities	22
Mean Solar Magnetic Field	
Stanford Mean Solar Magnetic Field Map	23
Stanford Mean Solar Magnetic Field Table	24
Solar Wind Measurements	
Scintillation Observations	25
Solar Proton Event (Provisional)	unnumbered

ALERT PERIODS

INTERNATIONAL URSIGRAM
AND WORLD DAYS SERVICE

NOVEMBER 1977

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions				Outstanding events	Forecasts			Alert Situations
						Location Lat-Long	No. of Flares Total	M	X		Date	Location Lat-Long	Desc*	
305	1	31	88	97	07	N22W24	0	0	0		1	N22W24	Q	SOLQUIET MAGQUIET
						S19W41	0	0	0			S19W41	Q	
						N30W23	0	0	0			N30W23	Q	
						S24E33	0	0	0			S24E33	Q	
						N19E53	0	0	0			N19E53	Q	
306	2	01	55	96	04	S18W55	0	0	0		2	S18W55	Q	SOLQUIET MAGQUIET
						N30W38	0	0	0			N30W38	Q	
						S23E19	0	0	0			S23E19	Q	
						N20E41	0	0	0			N20E41	Q	
307	3	02	41	95	04	N19E25	0	0	0		3	N19E25	Q	SOLQUIET MAGQUIET
						S23E05	0	0	0			S23E05	Q	
						N30W52	0	0	0			N30W52	Q	
308	4	03	31	92	05	N20E09	0	0	0		4	N20E09	Q	SOLQUIET MAGQUIET
						S23W07	0	0	0			S23W07	Q	
309	5	04	27	91	07	S23W18	0	0	0		5	S23W18	Q	SOLQUIET MAGQUIET
						N19W01	1	0	0			N19W01	Q	
310	6	05	40	92	12	S22W33	0	0	0		6	S22W33	Q	SOLQUIET MAGQUIET
						N20W13	0	0	0			N20W13	Q	
311	7	06	33	93	12	S22W44	0	0	0		7	S22W44	Q	SOLQUIET MAGQUIET
						N21W30	0	0	0			N21W30	Q	
						N24E71	0	0	0			N24E71	Q	
312	8	07	47	92	09	S22W57	1	0	0		8	S22W57	Q	SOLQUIET MAGQUIET
						N23W44	0	0	0			N23W44	Q	
						N22E71	0	0	0			N22E71	Q	
						N23E45	0	0	0			N23E45	Q	
313	9	08	47	92	05	S20W70	0	0	0		9	S20W70	Q	SOLQUIET MAGQUIET
						N23W58	1	0	0			N23W58	Q	
						N23E58	0	0	0			N23E58	Q	
						N23E33	0	0	0			N23E33	Q	
314	10	09	26	93	03	N25E47	1	0	0		10	N25E47	Q	SOLQUIET MAGALERT 12/13
						S23E38	1	0	0			S22E38	Q	
315	11	10	25	95	10	N23E33	0	0	0		11	N23E33	Q	SOLQUIET MAGALERT 11/12
						S23E23	4	0	0			S23E23	Q	
316	12	11	42	97	05	N23E20	1	0	0		12	N23E20	Q	SOLQUIET MAGALERT 13/14
						S23E12	0	0	0			S23E12	Q	
						N37E69	0	0	0			N37E69	Q	
317	13	12	40	93	14	N24E08	0	0	0		13	N24E08	Q	SOLQUIET MAGALERT 13/15
						S22W01	0	0	0			S22W01	Q	
						N38E61	0	0	0			N38E61	Q	
318	14	13	44	96	20	N24W02	0	0	0		14	N24W02	Q	SOLQUIET MAGALERT MINOR 14/15
						S23W14	0	0	0			S23W14	Q	
						N37E53	1	0	0			N37E53	Q	
319	15	14	90	100	30	N22W17	0	0	0		15	N22W17	Q	SOLQUIET MAGALERT MINOR 15
						S23W23	0	0	0			S23W23	Q	
						N38E40	0	0	0			N38E40	Q	
						S25W74	3	0	0			S25W74	Q	
						N30E55	0	0	0			N30E55	Q	
						S18E72	0	0	0			S18E72	Q	
						S25W16	0	0	0			S25W16	Q	
320	16	15	61	101	23	N38E25	2	0	0		16	N38E25	Q	SOLQUIET MAGNIL
						N24E43	0	0	0			N24E43	Q	
						N23E63	0	0	0			N23E63	Q	
						S19E57	0	0	0			S19E57	Q	
						S23W36	0	0	0			S23W36	Q	
						S23W30	0	0	0			S23W30	Q	
321	17	16	68	98	12	N40E12	0	0	0		17	N40E12	Q	SOLQUIET MAGQUIET
						N25E27	1	0	0			N25E27	Q	
						S18E45	0	0	0			S18E45	Q	
						S22W49	2	0	0			S22W49	Q	
						S23W44	1	0	0			S23W44	Q	
						N26W42	0	0	0			N26W42	Q	
322	18	17	122	103	06	N25W54	0	0	0		18	N25W54	Q	SOLQUIET MAGQUIET
						S23W64	2	0	0			S23W64	Q	
						N38E02	0	0	0			N38E02	Q	
						S18E29	0	0	0			S18E29	Q	
						S24W60	0	0	0			S24W60	Q	
						N23E17	0	0	0			N23E17	Q	
						N15E50	0	0	0			N15E50	Q	

ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

NOVEMBER 1977

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions: Location Lat-Long	No. of Flares: Total	M	X	Outstanding events	Forecasts: Date	Location Lat-Long	Desc*	Alert Situations
323	19	18	89	104	05	S24W77	0	0	0		19	S24W77	Q	SOLQUIET MAGQUIET
						N38W10	0	0	0			N38W10	Q	
						S17E14	0	0	0			S17E14	Q	
						S24W72	0	0	0			S24W72	Q	
						N23E04	1	0	0			N23E04	Q	
						N14E33	0	0	0			N14E33	Q	
324	20	19	76	102	06	N38W24	0	0	0		20	N38W24	Q	SOLQUIET MAGQUIET
						S18E03	0	0	0			S18E03	Q	
						N23W09	0	0	0			N23W09	Q	
325	21	20	59	102	04	N38W36	1	0	0		21	N38W36	Q	SOLQUIET MAGQUIET
						N36W26	0	0	0			N36W26	Q	
						N23W22	1	0	0			N23W22	Q	
						S19W09	0	0	0			S19W09	Q	
326	22	21	67	95	03	N13W62	0	0	0		22	N13W62	Q	SOLQUIET MAGQUIET
						N39W49	0	0	0			N39W49	Q	
						N24W34	0	0	0			N24W34	Q	
327	23	22	49	92	04	N24W47	2	0	1		23	N24W72	E	SOLQUIET MAGALERT 23/24
						N25W13	0	0	0			N25W13	Q	
						N21E39	0	0	0			N21E39	Q	
328	24	23	32	90	04	N26W60	0	0	0		24	N26W60	Q	SOLQUIET MAGALERT 24/25
						N26W26	0	0	0			N26W26	Q	
329	25	24	30	89	05	N25W79	0	0	0		25	N25W79	Q	SOLQUIET MAGALERT 25/26
						N24W44	0	0	0			N24W44	Q	
330	26	25	35	87	10	N26W87	0	0	0	MINOR SC OBSERVED	26	N26W87	Q	SOLQUIET MAGALERT 26
						N26W53	0	0	0	25/1205Z		N26W53	Q	
						N15W58	0	0	0			N15W58	Q	
331	27	26	34	86	13	N25W68	1	0	0	A SMALL SSC APPEARED	27	N25W68	Q	SOLQUIET MAGALERT 27
						N22E76	0	0	0	TO HAVE OCCURRED AT		N22E76	Q	
						N22E05	0	0	0	26/1712Z		N22E05	Q	
332	28	27	23	76	10	N25W82	0	0	0		28	N25W82	Q	SOLQUIET MAGNIL
						N19E62	0	0	0			N19E62	Q	
333	29	28	11	88	10	N19E45	1	0	0		29	N19E45	Q	SOLQUIET MAGQUIET
334	30	29	24	88	05	N18E31	0	0	0		30	N18E31	Q	SOLQUIET MAGQUIET
						S19E84	0	0	0			S18E84	Q	
335	01	30	16	88	07	S22E71	1	0	0		01	S22E71	Q	SOLQUIET MAGQUIET

* Q=Quiet E=Eruptive A=Active P=Proton C=Caution D=Doubtful O.G.=Other Groups MF=Major Flare

RELATIVE SUNSPOT NUMBERS

ZURICH, R_Z

1976 FINAL 1977 PROVISIONAL

DAY	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
1	0	20	15	0	7	15	44	42	17	22	45	44
2	0	32	19	6	11	14	43	45	15	29	31	42
3	0	25	19	6	10	22	43	42	24	29	48	22
4	0	22	16	6	7	23	49	39	19	25	45	21
5	0	21	18	6	7	16	40	40	23	20	38	20
6	0	13	7	9	6	16	33	40	26	26	47	23
7	7	0	7	6	7	12	41	25	28	25	54	34
8	19	0	26	20	0	19	38	20	25	18	49	25
9	22	0	21	20	0	25	33	17	30	38	45	31
10	19	0	23	19	0	29	29	23	25	40	36	25
11	22	14	25	19	8	34	27	9	23	45	23	25
12	16	19	48	9	12	35	22	8	29	51	27	24
13	12	23	66	8	16	26	20	10	40	48	53	26
14	32	22	61	7	22	33	25	7	40	47	45	24
15	34	28	45	0	34	26	8	0	42	53	48	33
16	36	18	49	0	33	21	8	0	38	56	53	41
17	34	38	44	0	32	20	8	0	36	53	58	46
18	24	26	37	0	29	12	21	0	40	59	50	58
19	15	7	25	0	22	0	36	7	35	58	46	51
20	8	0	10	0	12	11	21	8	30	58	53	31
21	9	15	9	0	28	14	26	8	32	59	38	28
22	9	24	9	10	19	7	40	23	42	42	35	26
23	9	34	9	6	16	7	57	30	15	41	25	20
24	17	35	6	7	8	7	60	45	19	48	31	15
25	22	17	8	14	0	0	74	38	25	46	25	8
26	25	8	8	8	14	7	71	41	34	49	20	7
27	16	0	0	9	8	13	74	34	38	54	40	14
28	17	13	0	16	16	16	65	26	36	61	39	7
29	19	11		8	9	28	50	16	38	63	39	10
30	19	8		8	8	30	45	8	32	67	43	24
31	12	10		8		40		7	31		51	
MEAN	15.3	15.7	22.6	8.8	13.2	18.4	38.4	21.2	29.9	44.1	41.3	28.6

1976 yearly mean = 12.6

DAILY SOLAR FLUX AT 2800 MHz
OTTAWA ARO

FLUX ADJUSTED TO 1 A.U., S_a

1976 1977

DAY	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
1	70.2	73.8	81.7*	72.6	74.8	77.2	88.9	102.0	83.8*	83.1	93.8*	94.4
2	71.6	76.5	82.1	75.4	76.3	78.5	90.9*	100.7	82.8	84.2	93.2	93.6
3	71.2	76.0	80.9	74.8	76.6	81.9	93.0*	97.4	82.3	87.2	97.4	90.4
4	71.3	75.5	78.7	76.9	76.8	81.4*	94.2	94.0	82.9*	84.2	98.8	89.4
5	70.1	74.0	77.8	77.6	75.5	79.6	98.2*	88.8*	86.4	85.6	104.8*	90.6
6	70.1	72.4	75.2	77.6	76.1	78.5	90.6	90.2	88.2	84.9	103.5	91.1
7	69.7	71.4	74.6	77.2	75.5*	77.1*	92.0	85.2	86.9	89.3	105.5	90.2
8	70.8	69.6	78.6	81.6	74.3	77.9	91.9*	82.1	85.1	91.6	103.8	90.3
9	74.3	68.4	83.1	80.3	74.8	83.6	90.9	79.0	85.9	95.9	100.7	91.1
10	76.8	68.8	83.5	80.5	76.5	85.8	89.2*	76.9	87.2	99.8	96.4	93.1
11	78.3	71.2	84.6	78.9	79.2	88.8	87.2	76.2	87.6	104.6	95.3	94.9
12	78.6	74.9	86.9*	78.6	80.2	89.7	83.3	75.8	86.5	107.8	100.8	91.4
13	78.1	77.5	88.5	77.9	82.7	81.5	84.2	77.8	89.0	112.9	98.5	94.0
14	81.0	74.5	85.2	77.2	83.4	84.8	82.3	78.8	87.5	118.2	98.9	97.9
15	79.8	75.6	84.4	74.8	86.8	85.0	82.3	76.0	86.9	120.7	98.2	97.9
16	77.8	77.5	85.7	74.1	83.7	85.1	81.4	76.9	87.3	120.4	96.8	95.9
17	75.5	76.1	89.6*	74.1	83.6	84.1	82.4	76.5	87.1	120.6	94.9	100.4
18	73.8	75.4	86.5	73.9	80.8	82.9	84.3	76.9	88.6	120.5	95.4	102.8*
19	72.9	76.9	82.8	74.8	79.8*	82.1	85.2	76.9	87.0	104.5	105.0	99.2
20	71.7	75.2	81.1	72.3	80.4*	81.3	88.9	80.1	88.7	100.8	99.6*	95.7*
21	71.8	74.0	78.6	72.8	80.8	81.4	92.4	81.7	90.8	104.9*	98.6*	92.8
22	73.4	76.8	75.9	74.6	80.1	82.9	98.8*	83.1	89.6	102.4	93.9	89.3
23	73.7	78.7	75.9	74.7	77.5	82.4	99.4	85.0	86.0	99.3	87.3	88.0
24	74.2	77.4	74.2	74.8	76.5	79.2	107.4	84.0	86.0	100.6	88.3	86.7
25	75.6	74.9	74.3	74.8	76.4	77.4	113.8	86.0	87.7	98.8	88.1	84.7
26	75.6	76.8	72.3	75.1	75.4	76.8	120.7	86.0	86.4	99.4	88.6	84.1
27	75.2	75.3	72.8	74.5	74.9	77.9	115.9*	85.4	85.4	100.0	88.5	83.8
28	74.5	77.1	72.6	74.4	74.2	79.1	113.4	87.5	82.4	100.8	90.3*	85.6
29	74.8	76.1		75.4	74.8	81.7	111.9	86.7	86.1	99.4	90.3	85.6
30	75.1	76.3		74.6	76.6	84.9	106.9	84.1	85.5	97.7	94.9	85.3
31	76.4	79.6		74.1		92.0		80.4	84.7		95.9	
MEAN	74.3	74.9	80.3	75.8	78.2	81.4	94.5	83.7	86.4	100.9	96.3	91.6

* adjusted for burst

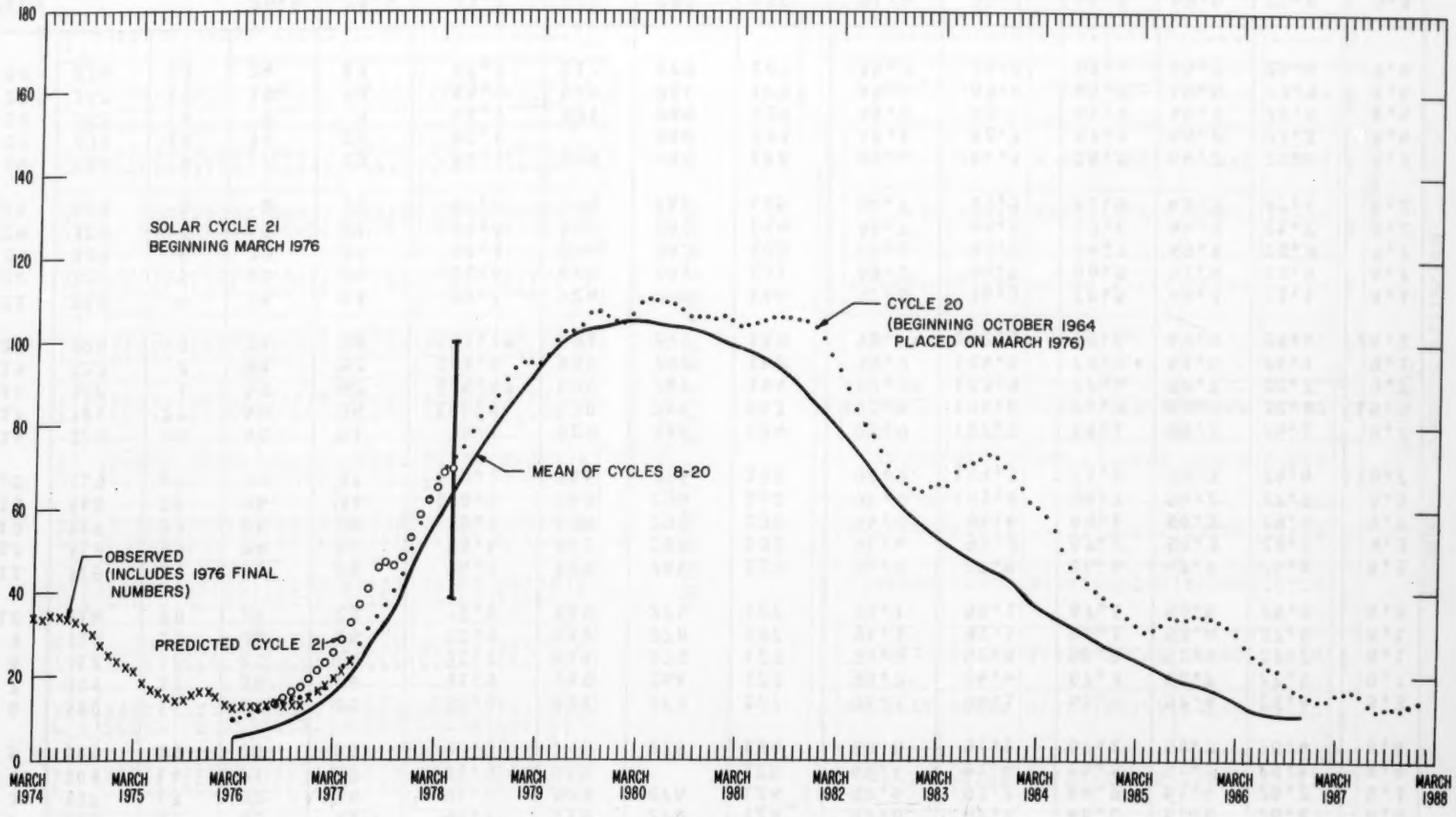
DAILY SOLAR INDICES

NOVEMBER 1977

NOV 1977	YEAR DAY	BARTELS 27-DAY CYCLE NUMBER	SUNSPOT NUMBERS		OBSERVED FLUX	SOLAR FLUX ADJUSTED TO 1 A.U.								
			R_Z	$R_{A'}$	OTTAWA 2800	AFGL 15400	AFGL 8800	AFGL 4995	OTTAWA 2800	AFGL 2695	AFGL 1415	AFGL 606	AFGL 410	AFGL 245
1	305	11	44	41	95.8	523	280	133	94.4	97.6	65.9	47.6	30.2	13.6
2	306	12	42	33	95.1	518	278	128	93.6	95.8	68.0	50.5	26.0	8.5
3	307	13	22	24	91.9	528	276	126	90.4	93.2	64.5	51.4	26.2	9.3
4	308	14	21	22	90.9	518		125	89.4	91.4	64.8	51.1	25.5	8.9
5	309	15	20	25	92.2	515	275	126	90.6	91.0	67.2	50.3	26.4	8.8
6	310	16	23	25	92.8	512	273	127	91.1	94.1	66.4	52.4	26.8	8.3
7	311	17	34	28	91.9	510	268	123	90.2	94.4	67.3	50.7	27.5	9.7
8	312	18	25	28	92.0	511	270	125	90.3	92.0	66.9	51.0	27.7	8.1
9	313	19	31	26	92.9	512	270	127	91.1	92.1	66.1	53.4	27.5	8.1
10	314	20	25	23	95.0	519	274	127	93.1	95.1	67.6	50.5	25.8	8.6
11	315	21	25	26	96.8	529	286	133	94.9	97.5	66.4	47.7	24.2	8.1
12	316	22	24	27	93.4	541	288	130	91.4	99.3	67.2	50.3	29.6	9.8
13	317	23	26	25	96.0	535	293	130	94.0	96.6	69.8	50.5	29.4	9.7
14	318	24	24	31	100.0	540	296	133	97.9	101.8	68.7	54.2	27.7	8.5
15	319	25	33	37	100.1	546	296	135	97.9	104.1	71.5	50.3	28.4	10.7
16	320	26	41	51	98.1	529	286	134	95.9	102.5	68.1	55.3	26.1	9.7
17	321	27	46	54	102.8	530	285	143	100.4	104.2	71.3	54.0	32.0	15.9
18	322	1	50	62	104.4*	535	286	144	102.0*	103.9	77.4	52.7	22.7	9.7
19	323	2	51	52	101.6	534	292	142	99.2	104.8	73.0	51.4	26.1	9.1
20	324	3	31	39	98.1*	531	290	139	95.7*	102.3	72.6	49.4	28.4	26.2
21	325	4	28	33	95.1	524	285	134	92.8	96.3	70.5	48.3	23.1	8.1
22	326	5	26	20	91.6	520	281	131	89.3	94.5	66.5	51.4	23.0	8.7
23	327	6	20	25	90.3	524	283	129	88.0	93.9	64.7	49.8	23.3	8.7
24	328	7	15	21	89.0	526	280	124	86.7	88.6	63.6	44.0	21.7	8.2
25	329	8	8	12	87.0	528	282	125	84.7	89.5	61.5	43.3	22.1	8.2
26	330	9	7	10	86.3	525	283	123	84.1	86.3	59.0	44.2	21.6	8.2
27	331	10	14	12	86.1		285	123	83.8	88.7	60.3	43.2	23.3	8.4
28	332	11	7	9	88.0	521	285	125	85.6	89.7	61.9	46.3	22.5	8.4
29	333	12	10	12	88.0	515	281	125	85.6	89.6	64.3	45.6	23.9	8.4
30	334	13	24	18	87.8	517	279	127	85.3	88.8	62.1	46.3	25.6	8.6
MEAN			26.6	28.4	93.7	525	282	130	91.6	95.3	66.8	49.6	25.8	9.8

* Adjusted for burst.

Note: Data gaps in AFGL Sagamore Hill are due to equipment problems.



PREDICTED AND OBSERVED SUNSPOT NUMBERS

SMOOTHED OBSERVED AND PREDICTED SUNSPOT NUMBERS
CYCLE 21

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1976	15.2	13.2	12.2	12.6	12.5	12.2	12.9	13.9	14.1	13.3	13.3	14.7
1977	16.6	17.9	19.8	21.9	23.7	26.9	30.2	33.6	37.0	40.8	45.1	49.4
						(1)	(3)	(5)	(8)	(11)	(13)	(16)
1978	53.7	58.4	62.8	66.4	69.7	72.8	75.9	79.5	83.7	87.3	90.6	93.8
	(19)	(22)	(25)	(28)	(31)	(34)	(35)	(34)	(34)	(33)	(34)	(35)
1979	96.4	98.8	101.6	104.7	107.0	108.5	109.4	110.1	110.2	110.3	110.7	111.2
	(36)	(37)	(40)	(41)	(42)	(44)	(47)	(50)	(51)	(52)	(51)	(50)
1980	111.9	111.6	110.6	109.6	108.9	108.6	108.3	107.7	107.5	107.3	106.5	105.1
	(50)	(52)	(52)	(52)	(52)	(52)	(52)	(53)	(54)	(56)	(56)	(54)
1981	103.5	102.6	101.5	100.7	100.1	99.3	98.3	96.8	94.8	92.6	90.2	87.8
	(52)	(51)	(50)	(48)	(46)	(45)	(45)	(43)	(41)	(39)	(38)	(38)
1982	85.8	83.7	81.5	78.6	75.6	73.1	70.3	68.1	65.3	62.3	60.2	58.7
	(36)	(34)	(33)	(32)	(30)	(28)	(24)	(23)	(22)	(21)	(21)	(21)
1983	57.2	55.6	53.8	52.4	51.2	49.7	48.3	47.1	46.2	45.2	43.9	42.1
	(22)	(21)	(22)	(23)	(24)	(26)	(27)	(29)	(29)	(29)	(28)	(27)
1984	39.8	37.8	36.5	35.5	34.1	32.9	31.8	30.8	29.5	28.3	27.1	26.1
	(27)	(28)	(29)	(30)	(29)	(29)	(27)	(26)	(26)	(25)	(25)	(25)
1985	25.4	24.6	23.7	22.8	21.8	20.9	20.0	18.9	18.2	18.0	17.5	16.7
	(25)	(24)	(23)	(22)	(21)	(21)	(22)	(22)	(23)	(23)	(23)	(22)
1986	15.8	14.8	13.9	13.0	12.2	11.8	11.4	11.3	11.1	10.9	11.0	11.3
	(21)	(20)	(19)	(18)	(17)	(16)	(15)	(14)	(12)	(11)	(10)	(10)
1987	11.8	12.4	13.0	13.7	14.4							
	(11)	(12)	(13)	(14)	(15)							

For each month, the upper figure is the observed or predicted Zürich smoothed sunspot number. The lower figure in parenthesis is the corresponding absolute value of the 90% prediction interval, an indication of the uncertainty above and below the predicted number. Observed numbers are those with no prediction intervals. The observed smoothed sunspot numbers are based on final Zürich numbers through 1976.

The predicted sunspot numbers are derived from a regression analysis based on cycles 8 through 20. Tests indicate that earlier cycles are from a different statistical population.

The table above assumes March 1976 as the minimum of solar cycle 20. The Office of Telecommunications is preparing similar predictions, using June 1976 as the observed minimum. Until the 1977 Zürich final relative sunspot numbers are available, either March or June 1976 is possible as the observed sunspot minimum.

Hα SOLAR FLARES

NOVEMBER 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE NOV	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
MONT	02	0828	0832	0838	S25	E14	.388		3.4	10	SF		C	0832	40		E
MONT	02	0849	0851	0855	N31	W40	.804		30.4	6	SF		C	0851	40		D
MONT	03	1219	1229	1240	N20	E20	.544		5.0	21	SF		C	1229	60		E
HTPR	05	0736	0741	0750	S24	W18	.418		4.0	14	SF		C	0741	10	.1	
HTPR	05	1229	1235	1241	S24	W21	.451		3.9	12	SF		C	1235	10	.1	
HTPR	05	1425	1428	1434	N20	W07	.457		5.1	9	SF		C	1428	20	.2	
PALE	06	1921	1922	1946	N22	E64	.932		11.6	25	SN	3	V		35		U F
MONT	08	1058	1106	1118	N23	W51	.845	15017	4.6	20	1N		C	1106	220		H
MONT	09	0847	0852	0903	S23	E48	.757		13.0	16	SF		C	0852	40		E
MONT	09	1124	1129	1149	S25	E48	.762		13.1	25	SF		C	1129	20		D
HTPR	10	0834	0847	0918	N25	E17	.576		11.6	44	SF		C	0847	30	.3	E
PALE	10	1754	1754	1759	S22	E30	.546		13.0	5	SF	3	C		26		DE
PALE	10	2057	2124	2125	S22	E27	.509		12.9	28	SN	3	C		45		
HTPR	11	1442E		1505	N23	E30	.659		13.9	23D	SF		C	1443	20	.2	
HTPR	11	1442E		1503	N23	E38	.732		14.5	21D	SF		C	1443	20	.2	E
HTPR	11	1510	1511	1519	N20	E17	.513		12.9	9	SF		C	1511	10	.1	
BUCA	12	0800		0850	N26	W10	.549		11.6	50	SF		C	0815	43	.5	E
BUCA	12	0819	0824	0840	S24	E08	.337		12.9	21	SN		C	0824	107	1.2	
MONT	14	0813	0814	0816	S20	E90	.999		21.1	3	SF		C	0814	20		D
MONT	14	1012	1016	1024	S20	E88	.998		21.0	12	SF		C	1016	20		D
MONT	14	1204	1207	1211	S20	E87	.997		21.0	7	SF		C	1207	20		D
PALE	14	2005	2006	2011	S25	W68	.925		9.7	6	SF	3	V		23		FDE
PALE	14	2005	2006	2011	S25	W68	.925		9.7	6	SF	3	C		23		FDE
PALE	14	2116	2117	2120	S25	W69	.931		9.7	4	SF	3	C		22		FDE
PALE	14	2116	2117	2120	S25	W69	.931		9.7	4	SF	3	V		22		FDE
HTPR	15	0801	0804	0818	S20	E68	.923		20.4	17	SN		C	0804	10	.1	
HTPR	15	0801	0809	0818	S20	E68	.923		20.4	17	SN		C	0804			
HTPR	15	0842	0847	0857	S20	E68	.923		20.5	15	SF		C	0847	10	.1	
HTPR	16	0748E		0800	S25	W46	.745		12.9	12D	SN		C	0758	30	.3	
PALE	16	1856	1858	1920	S24	W51	.791		13.0	24	SF	3	C		28		FDE
RAMY	17	1215E	1215U	1225	N23	E23	.592		19.2	10D	SN	3	C		95		
MONT	18	1157	1200	1208	N38	W02	.687		18.3	11	SF		C	1200	40		E
HTPR	19	1245	1250	1258	S26	W18	.453		18.2	13	SF		C	1250	10	.1	G
HTPR	20	1132	1135	1142	N21	W13	.487		19.5	10	SN		C	1135	60	.6	E
WEND	20	1215		1229	N40	W23	.765		18.8	14	SN						
WEND	20	1235		1249	N22	W16	.521		19.3	14	SN						
WEND	20	1328		1335	N23	W10	.498		19.8	7	SN						
PALE	21	0217	0218	0247	N24	W23	.598		19.4	30	SF	3	C		48		DE
HTPR	22	0945	1007	1105	N23	W40	.744	15031	19.4	80	2B		C	1007	400	5.6	EI
HTPR	22	1222	1223	1232	S25	W22	.486		20.9	10	SF		C	1223	20	.2	
MONT	24	0907	0909	0920	N24	W63	.925		19.7	13	SF		C	0909	20		D
HTPR	27	1333	1338	1346	N15	W88	1.000		21.0	13	SF		C	1338	20	.4	
HTPR	27	1442	1447	1450	N26	W74	.977		22.1	8	SF		C	1447	30	.7	
MONT	28	0925E	0930	0930D	N15	W90	1.000		21.6	5D	SF		C	0930	20		D
HITK	30	0809	0810	0826	N19	E36	.674		2.7	17	SN		C	0810	60	.8	E

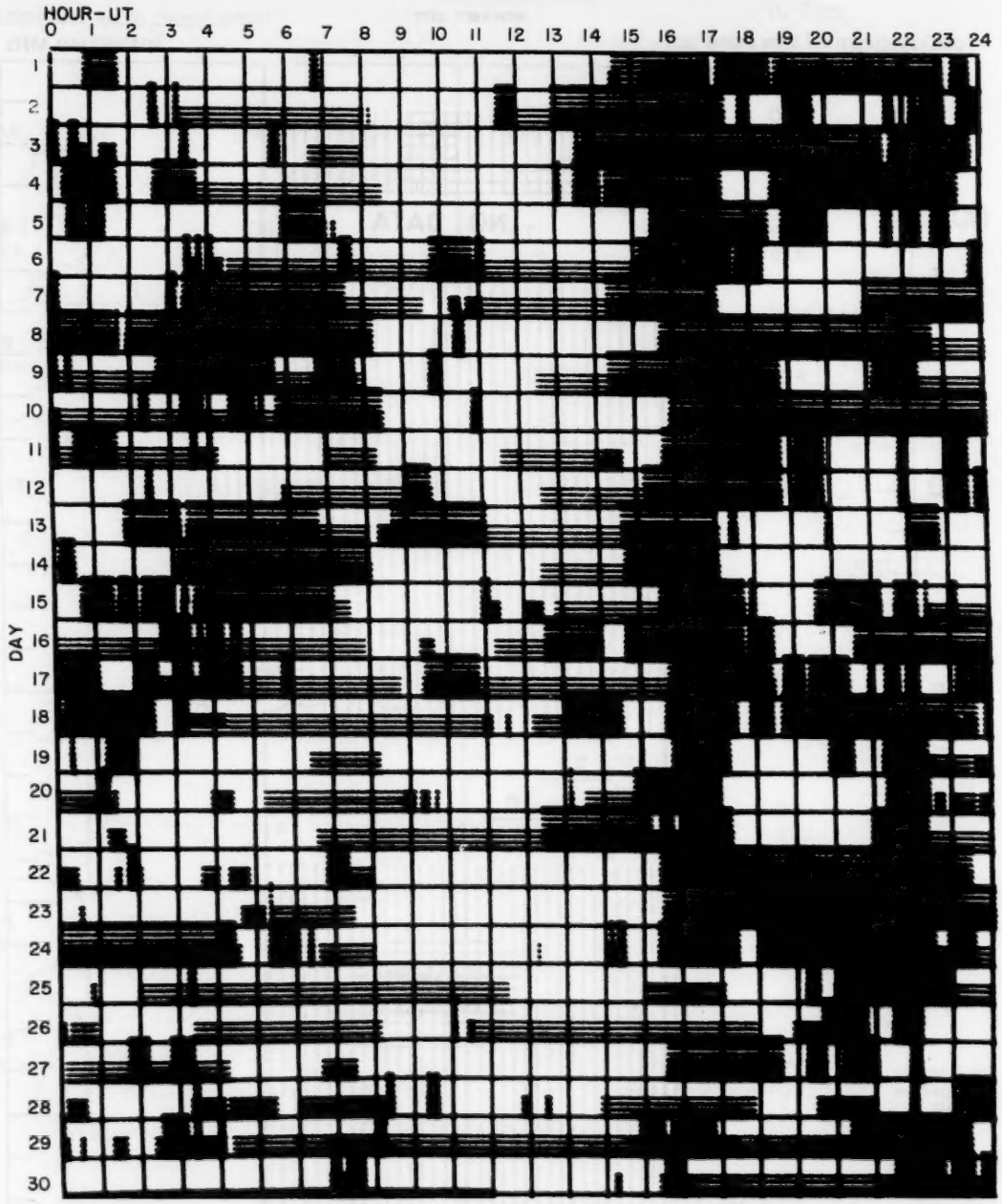
"Remarks":

A = Eruptive prominence whose base is less than 90° from central meridian.
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No visible spots in the neighborhood.
H = Flare accompanied by a high speed dark filament.
I = Active region very extended.
J = Distinct variations of plage intensity before or after the flare.
K = Several intensity maxima.
L = Existing filaments show signs of sudden activity.
M = White-light flare.
N = Continuous spectrum shows effects of polarization.
O = Observations have been made in the calcium II lines H and K.
P = Flare shows helium D_3 in emission.
Q = Flare shows the Balmer continuum in emission.
R = Marked asymmetry in Hα line suggests ejection of high velocity material.
S = Brightness follows disappearance of filament (same position).
T = Region active all day.
U = Two bright branches, parallel (||) or converging (Y).
V = Occurrence of an explosive phase: important and abrupt expansion in about a minute with or without important intensity increase.
W = Great increase in area after time of maximum intensity.
X = Unusually wide Hα line.
Y = System of loop-type prominences.
Z = Major sunspot umbra covered by flare.

INTERVALS OF NO FLARE PATROL OBSERVATION

FOR PRECEDING SOLAR FLARE TABLE

NOVEMBER 1977



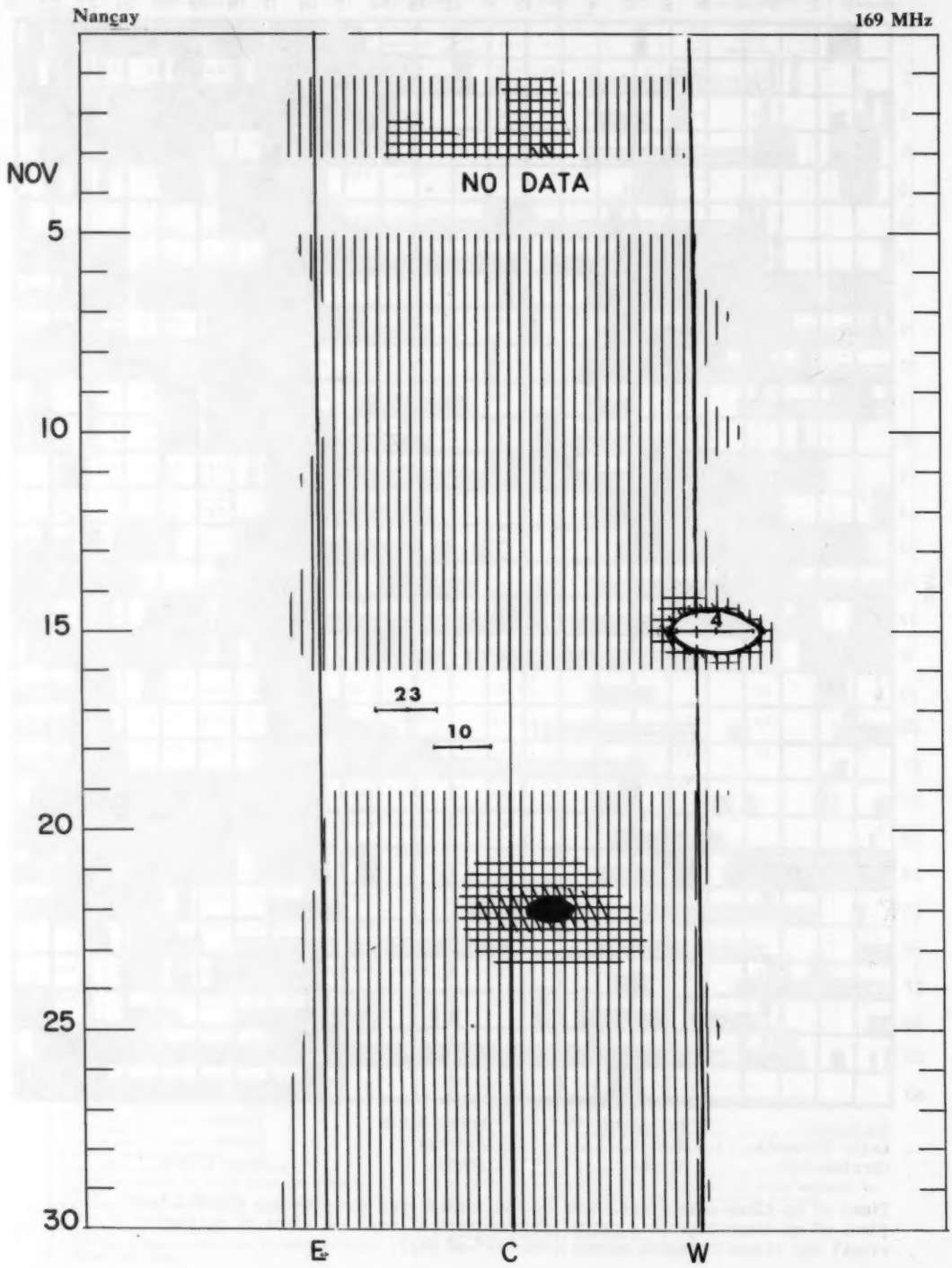
Bucharest	Istanboul	Monte Mario	Tehran
Haute Provence	Manila	Palehua	Upice
Herstmonceux	Mitaka	Ramey	Wendelstein

Times of no flare patrol are shown by the shaded area for each day divided into times of no cinematographic patrol (bottom half of day) and times of neither visual nor cinematographic patrol (top half of day).

12
Nov 77

SOLAR RADIO EMISSION
INTERFEROMETRIC OBSERVATION

NOVEMBER 1977

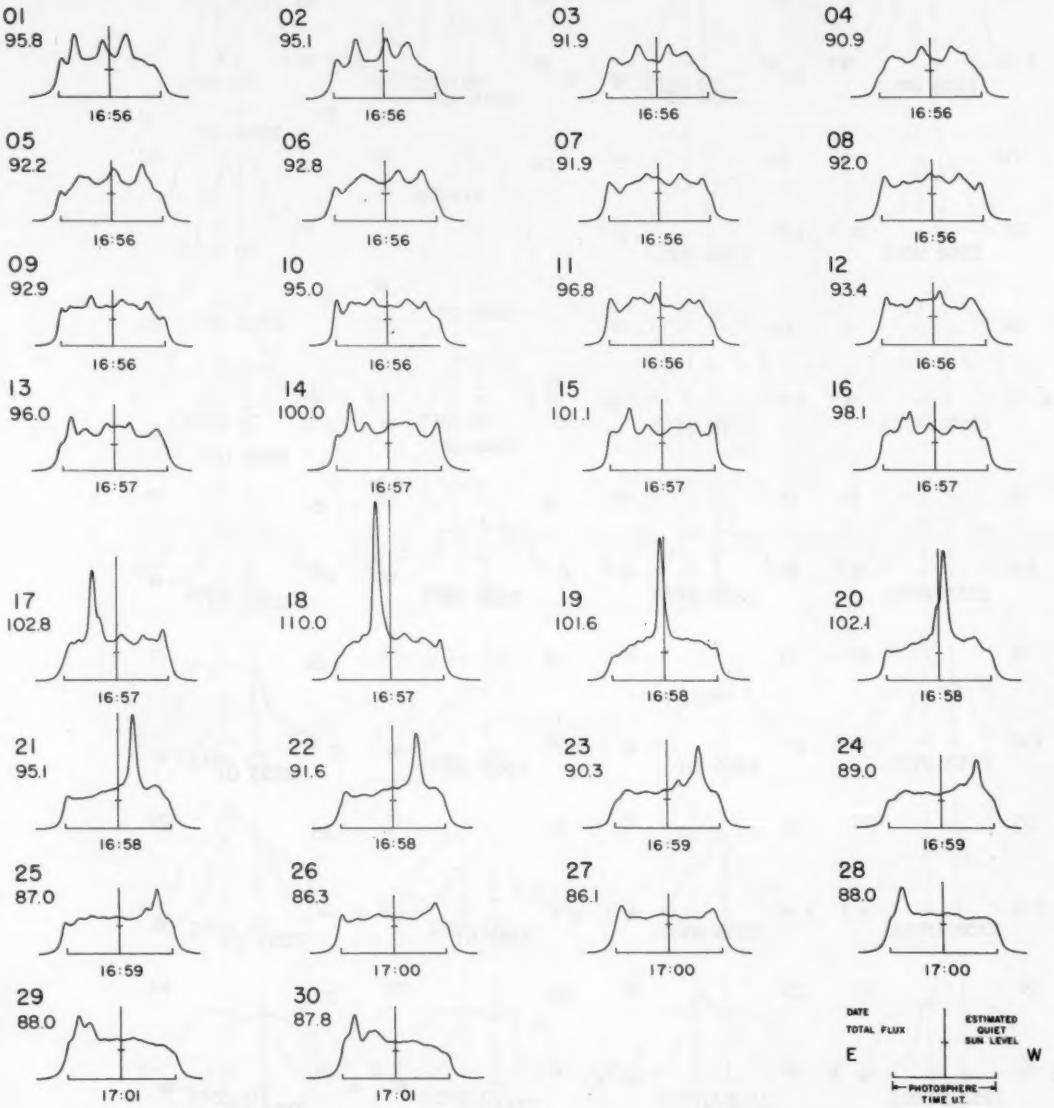


EAST-WEST SOLAR SCANS

NOVEMBER 1977

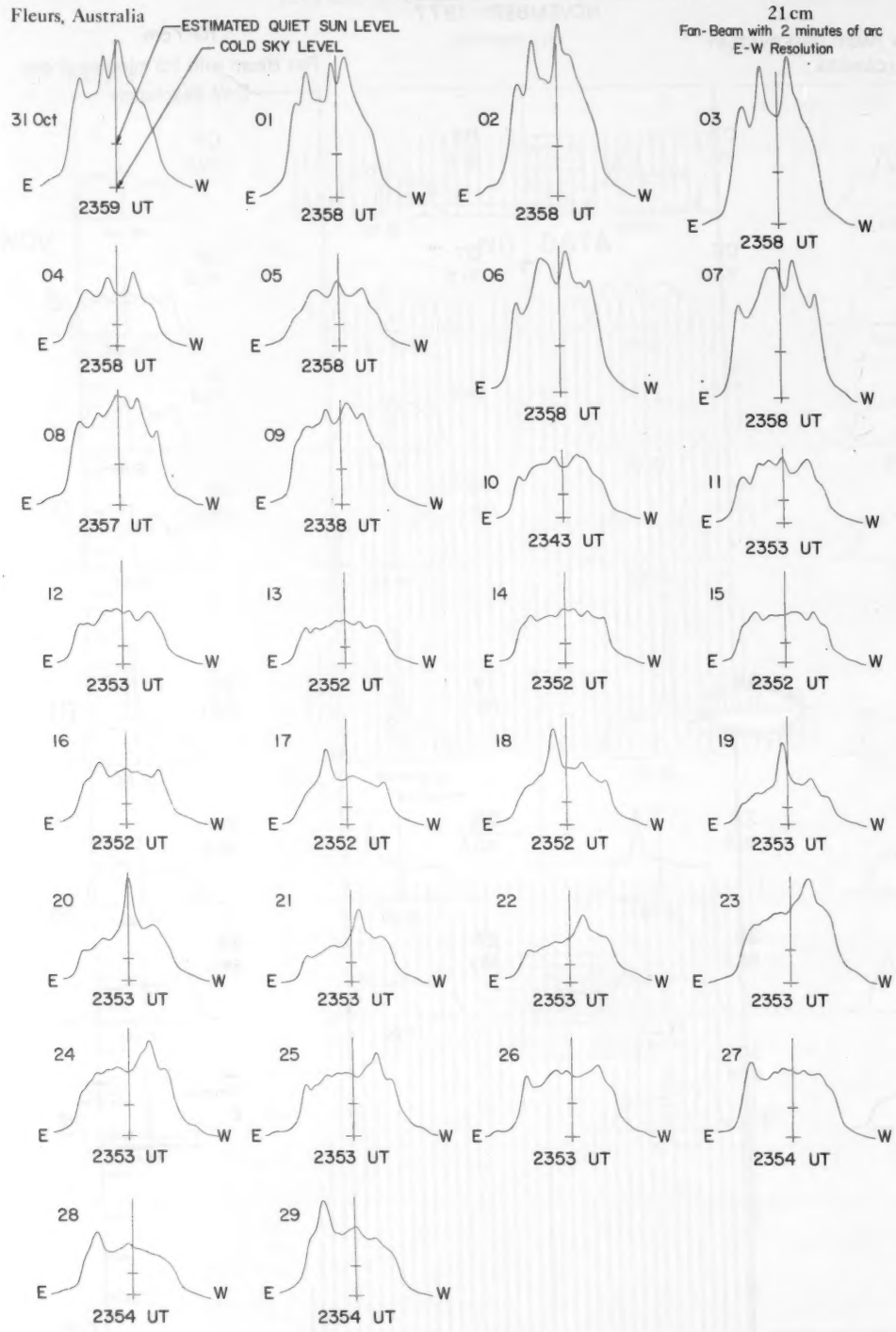
ALGONQUIN RADIO OBSERVATORY
CANADA

10·7cm
Fan Beam with 1·5 minutes of arc
E-W Resolution



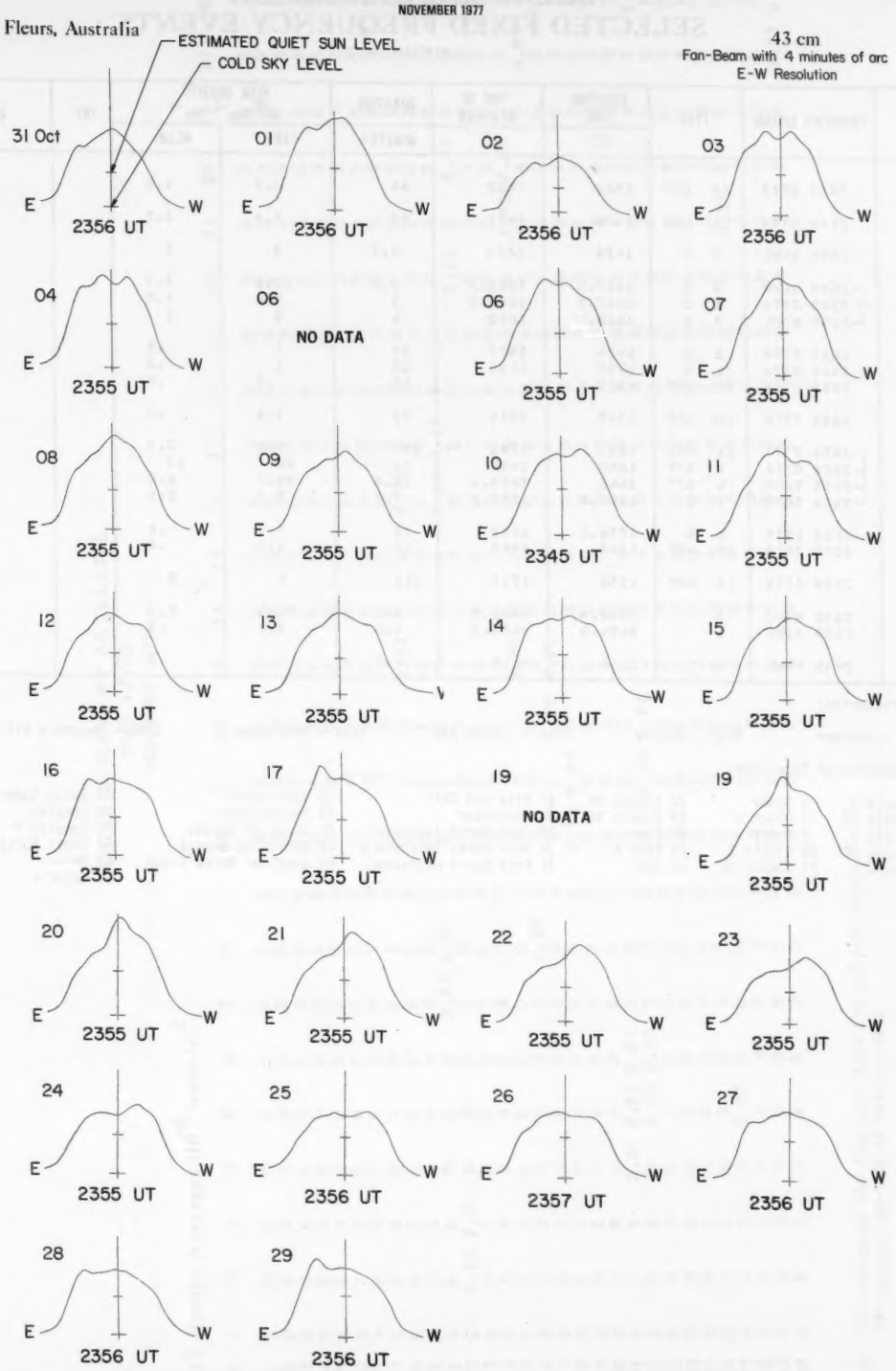
EAST-WEST SOLAR SCANS

NOVEMBER 1977



EAST-WEST SOLAR SCANS

NOVEMBER 1977



Errata: The August 1977 43 cm data should not include a scan for 29 August. Please delete the 29 August scan which appears on page 16 of the SGD, 397 Part I, September 1977 issue.

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

NOVEMBER 1977

	FREQUENCY	STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1}		INT	REMARKS
				UT	UT	MINUTES	PEAK	MEAN		
6	2800	OTTA	20 GRF	1920	1932	65	3.2	1.6		
11	2800	OTTA	20 GRF	1420	1450	90	2.8	1.5		
12	2695	BOUL	1 S	1828	1829	1.5	3	1		
13	2695	SGMR	3 S	1607.5	1608.5	2.5	12.2	3.7		1
	2800	OTTA	1 S	1607.5	1608.5	6	9.6	2.2		
	2695	BOUL	3 S	1608.5	1610	4	9	3		
15	2800	OTTA	1 S	1424	1427	10	1	.5		
	2800	OTTA	1 S	1755	1800	10	1	.5		
	2800	OTTA	20 GRF	1815		15	.8	.5		
16	2800	OTTA	20 GRF	1848	1910	80	1.6	.8		
18	2800	OTTA	21 GRF	1635	1700	150	6.8	3.4		
	2800	OTTA	4 S/F	1646	1650	11	26	13		
	2695	SGMR	4 S/F	1646	1650.4	10.6	29.7	8.9		2
	8800	SGMR	1 S	1647.9	1652.2	7.7	9.3	2.8		2
19	2800	OTTA	1 S	1756.2	1800	10	1.6	.8		
	2800	OTTA	20 GRF	1940	1945	15	1.6	.8		
20	2800	OTTA	20 GRF	1555	1710	310	4	2		
22	2695	MANI	3	0040.4	0041.5	4.1	10.4	2.3		1
	2695	MANI	1	0424.6	0426.3	4.4	9.2	.9		2
24	2695	PENT	1 S	2116	2117	4.5	1.4	.7		

Observatories:

BOUL = Boulder MANI = Manila OTTA = Ottawa ARO PENT = Penticton SGMR = Sagamore Hill

Explanation of Type Code:

1 Simple 1
2 Simple 1F
3 Simple 2
4 Simple 2F
5 Simple
6 Minor
7 Minor +
8 Spike
20 Simple 3
21 Simple 3A
22 Simple 3F
23 Simple 3AF
24 Rise
25 Rise A
26 Fall
27 Rise and Fall
28 Precursor
29 Post Burst Increase
30 Post Burst Increase A
31 Post Burst Decrease
32 Absorption
40 Fluctuation
41 Group of Bursts
42 Series of Bursts
43 Onset of Noise Storm
44 Noise Storm in Progress
45 Complex
46 Complex F
47 Great Burst
48 Major
49 Major +

SOLAR X-RAYS BY SATELLITE
SMS GOES
NOVEMBER 1977

.5 - 4Å Hourly Averages (10^{-5} watts/m^2)

MO DA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean
11/ 1	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/ 2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/ 3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/ 4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/ 5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/ 6	B	B	B	B	B	B	B	B	B	B	M	M	M	B	B	B	B	B	B	B	B	B	M	M	B
11/ 7	M	B	B	B	B	B	B	B	B	M	M	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/ 8	B	B	B	B	B	B	B	B	B	B	M	M	B	B	B	B	B	B	B	B	B	B	B	B	B
11/ 9	B	B	B	B	B	B	B	B	B	B	B	B	0.04	B	B	0.01	B	B	B	B	B	B	B	B	B
11/10	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/11	B	B	B	B	B	B	0.03	0.02	B	B	B	B	B	B	B	0.04	0.11	B	B	B	B	B	B	B	B
11/12	B	0.05	0.05	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	0.01	B	0.05	B	B	B
11/13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/15	B	B	B	B	B	B	B	B	B	B	B	B	0.02	M	B	B	B	B	B	B	0.02	0.02	B	B	B
11/16	B	B	B	B	B	B	B	0.08	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	0.07	B
11/17	B	B	B	B	B	B	B	B	B	B	B	0.22	0.05	B	B	B	B	B	B	B	B	B	B	B	0.01
11/18	B	B	B	B	B	B	B	B	B	0.04	0.04	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/19	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/21	B	B	B	0.01	0.01	0.01	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/22	B	B	B	B	0.04	0.03	B	B	B	B	0.43	0.02	B	B	B	B	B	B	B	B	B	B	B	B	0.02
11/23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/24	B	M	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/27	B	B	B	B	0.01	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	0.01	B	B	B	B
11/28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	0.25	0.01

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.

SOLAR X-RAYS BY SATELLITE
SMS GOES
NOVEMBER 1977

1 - 8Å Hourly Averages (10^{-4} watts/m^2)

MO DA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean
11/ 1	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/ 2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/ 3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/ 4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/ 5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/ 6	B	B	B	B	B	B	B	B	B	B	M	M	M	B	B	B	B	B	B	B	B	B	M	M	B
11/ 7	M	B	B	B	B	B	B	B	B	M	M	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/ 8	B	B	B	B	B	B	B	B	B	B	M	M	B	B	B	B	B	B	B	B	B	B	B	B	B
11/ 9	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/10	B	B	B	B	B	B	B	B	B	B	B	0.02	B	B	B	B	B	B	B	B	B	B	B	B	B
11/11	B	B	B	B	B	B	0.06	0.07	B	B	B	B	B	B	B	0.17	0.35	0.01	B	B	B	B	B	B	0.02
11/12	0.02	0.17	0.21	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	0.03	0.02	0.19	B	B	0.02
11/13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/15	B	B	B	B	B	B	B	B	B	B	B	B	B	M	B	B	B	B	B	B	B	B	B	B	B
11/16	B	B	B	B	0.03	B	B	0.02	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/17	B	B	B	B	B	B	B	0.01	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	0.01	B	B	B	B	B	B	B
11/19	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/21	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	0.01	B
11/22	B	B	B	B	0.03	B	B	B	B	B	0.33	0.05	0.01	B	B	B	B	B	B	B	B	B	B	B	0.02
11/23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/24	B	M	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	0.05	B	B	B	B	B	B	B	B	B	B
11/28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	0.02	B	B	B	B
11/29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11/30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.

SOLAR X-RAYS BY SATELLITE

GOES

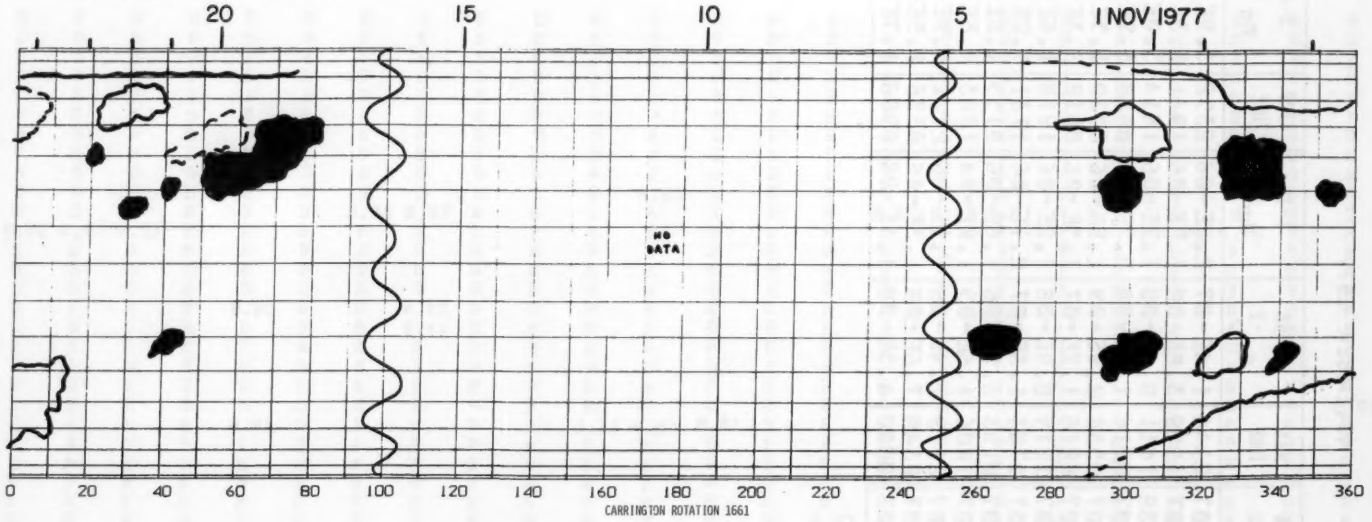
NOVEMBER 1977

DAY	BEGIN TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	MAX TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	1/2P TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}
5	2339	5.3E-10	1.0E-07	2346	1.4E-07	2.2E-06	2352	3.9E-08	1.1E-06
6	1917	2.6E-09	1.2E-07	1929	3.8E-08	1.2E-06	1941	1.3E-08	6.3E-07
13	1606	0.0E+00	9.9E-08	1611	8.4E-08	1.7E-06	1614	3.0E-08	8.8E-07
16	0012	1.0E-09	1.4E-07	0016	1.4E-08	2.7E-06	0028	3.2E-09	2.4E-07
16	0533	9.8E-10	1.2E-07	0536	2.9E-09	1.2E-06	0539	1.5E-09	1.2E-07
16	0738	6.6E-10	1.5E-07	0816	1.2E-07	1.5E-06	0818	2.3E-09	2.4E-07
17	1210	5.6E-10	2.8E-07	1215	8.9E-08	1.2E-06	1218	1.6E-08	6.8E-07
18	1644	1.0E-08	3.6E-07	1703	1.3E-07	2.1E-06	1731	5.2E-08	1.2E-06
21	0150	8.2E-09	3.6E-07	0153	3.2E-06	1.6E-06	0155	1.0E-08	4.0E-07
22	0946	0.0E+00	1.6E-07	1006	1.6E-05	1.0E-04	1023	4.8E-06	5.0E-05
24	2114	2.8E-09	1.7E-07	2119	7.4E-08	1.1E-06	2122	1.9E-08	6.3E-07
30	0330	3.6E-09	1.7E-07	0348	7.6E-08	1.3E-06	0356	1.9E-08	6.4E-07
30	0837	4.2E-09	2.3E-07	0850	4.5E-08	1.1E-06	0906	1.7E-08	6.8E-07

HELIUM 10830Å SYNOPTIC MAPS

CARRINGTON ROTATION 1661

KITT PEAK NATIONAL OBSERVATORY



CORONAL HOLES

Helium D3 Chromosphere at Solar Limb

NOVEMBER 1977

Big Bear Solar Observatory

Only three D3 limb scans were made during November. These data are presented in numerical form rather than graphically.

Position angles of coronal hole boundaries (in degrees)

Date	North		South	
November 7	+25	-6	-148	+162
" 12	+23	-22	-157	+168
" 18	+30	-25	-155	+170

INFERRED IP MAGNETIC FIELD

BARTELS ROTATION	DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1950	MAR 7							-	TA	A*		TA						*	*	AT			T*			-	TA	
1951	APR 3							*				*								AT	TA T*	T*			*	AT	TA A*	
1952	APR 30		AT					TA	AT T*		-			-	-	-			A*	TA	AT AT			A*			-	
1953	MAY 27	-						*	TA						-	*			-					T*				
1954	JUN 23						AT			AT		TA T*	AT				TA A*						AT A*	TA	AT AT			A*
1955	JUL 20		T*								TA A*									AT T*	TA TA	TA -	TA TA					
1956	AUG 16							TA T*								*		AT			-	AT -	AT -	AT -	TA -	-	-	-
1957	SEP 12	-	-	AT -	-	-	-	-	-	-	-	AT -	-	AT -	AT -	-	AT -	-	-	-	-			AT		-		
1958	OCT 9	AT *	A*		A*		*				TA	A*			*	-	-	-	*		TA	AT	AT	-			AT	
1959	NOV 5	AT	TA			TA		T*		*	AT *		-		*	-											*	
1960	DEC 2							TA		*						AT		*					- *			-	TA -	
1961	DEC 29	-	AT -	*	*	*			AT				*			*	A*		*	*			*					AT
1962	1977 JAN 25			-			-	-	TA -		A*			AT -			*	-			*	-				TA		
1963	FEB 21	AT	-	-	-	-	TA		TA			*									-			-				
1964	MAR 20		TA		AT					*			-	-						A*				-				
1965	APR 16			TA		TA -	AT	TA		TA		AT				-	-	TA		AT AT				TA				AT
1966	MAY 13	TA	-	-		TA			TA											AT	- -	AT T*	- T*				AT AT	-
1967	JUN 9								TA		-			TA						AT A*					AT *	A*		TA TA
1968	JUL 6										A*			T*	TA	TA		T*			AT			-	AT		-	
1969	AUG 2		TA						TA	-			TA	*								AT	TA					
1970	AUG 29			-	-	-		TA										AT	AT			AT	TA	TA -	AT	AT		
1971	SEP 25						-	-	-	-	-	-					TA				TA							
1972	OCT 22					-	AT														AT AT					*		
1973	NOV 18			TA	AT						-		AT															

▨ = definitely towards the sun □ = definitely away from the sun

T = towards the sun A = away from the sun * = effect doubtful or not discernible - = missing data

The table shows daily inferences of the polarity of the interplanetary magnetic field. The first half of the day is based principally on magnetograms produced by the magnetometer at the Vostok Antarctic Station of the USSR. The magnetometer of the U.S. Air Weather Service now operated at Thule by the Danish Meteorological Institute is used for the second half of the day.

Note: The Bartels Rotation numbers after Rotation number 1955 were incorrect in this Table in SGD issues 386 Part I through 389 Part I.

produced by the magnetometer at the Vostok Antarctic Station of the USSR. The magnetometer of the U.S. Air Weather Service now operated at Thule by the Danish Meteorological Institute is used for the second half of the day.

Note: The Bartels Rotation numbers after Rotation number 1955 were incorrect in this Table in SGD issues 286 Part I through 298 Part I.

STANFORD MEAN SOLAR MAGNETIC FIELD

BARTELS ROTATION	DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
1953	MAY 22																												1953
1954	JUN 18																												1954
1955	JUL 15																												1955
1956	AUG 11																												1956
1957	SEP 7																												1957
1958	OCT 4																												1958
1959	OCT 31																												1959
1960	NOV 27																												1960
1961	DEC 24																												1961
1962	1977 JAN 20																												1962
1963	FEB 16																												1963
1964	MAR 15																												1964
1965	APR 11																												1965
1966	MAY 8																												1966
1967	JUN 4																												1967
1968	JUL 1																												1968
1969	JUL 28																												1969
1970	AUG 24																												1970
1971	SEP 20																												1971
1972	OCT 17																												1972
1973	NOV 13																												1973

POLARITY OF THE MEAN SOLAR MAGNETIC FIELD: □ = FIELD >2μT, ▥ = -2μT ≤FIELD ≤2μT, ■ = FIELD <-2μT

No box visible indicates no data available for that day.

Note: Data are taken daily at 2000 UT. Dates given are not Bartels Rotation dates. These earlier dates correspond to the occurrence of phenomena on the sun which affect the Earth during the given Bartels Rotation.

STANFORD MEAN SOLAR MAGNETIC FIELD (MICROTESLA)

1976 1977

	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.
DAY												
01	-4	.	5	2	-7	-13	13	2	-16	-9	9	6
02	-2	.	0	0	-17	-6	15	-12	-23	-13	6	1
03	5	4	-6	-2	-16	-5	15	-18	-25	.	3	-14
04	13	15	-8	-9	-12	1	13	-26	-23	3	13	-16
05	21	.	-11	-17	-9	7	0	-31	-16	12	13	-11
06	23	3	-17	-22	-4	11	-19	-33	-5	18	11	-1
07	25	-7	-12	-20	0	7	-32	-26	-1	22	-6	11
08	18	-14	.	-13	5	-5	-31	-14	11	17	-13	31
09	13	-9	.	-9	8	.	.	-7	25	8	-13	46
10	8	-11	.	-3	2	-22	0	3	20	4	-4	48
11	-3	-8	21	3	-4	.	7	20	17	6	2	51
12	-4	.	19	11	-7	-29	17	29	12	13	12	32
13	-7	.	13	18	-14	-20	28	30	11	19	28	14
14	-1	8	11	3	-8	-5	38	24	5	23	35	-4
15	0	6	9	.	-8	4	40	26	7	40	46	-10
16	0	9	-3	-9	-11	12	31	18	.	.	39	-18
17	6	6	-12	-12	-9	20	24	13	5	38	20	-24
18	3	3	-13	-13	1	29	18	4	13	41	6	-5
19	8	0	-20	-15	13	27	19	1	19	31	6	-11
20	6	-4	.	-12	18	19	16	-1	23	17	1	-12
21	5	.	.	-7	21	12	10	6	24	2	3	.
22	1	-14	3	2	13	.	2	9	22	-3	7	-7
23	-10	-12	7	.	17	1	-2	22	18	-2	3	-4
24	-10	-12	12	15	9	-1	-7	25	8	-6	-3	0
25	-14	-7	13	13	6	4	-15	31	4	-1	-9	2
26	-16	-6	11	13	9	-10	-10	30	0	-3	-5	4
27	-16	0	9	10	7	-10	4	24	2	-8	-5	7
28	-10	6	5	8	2	-10	15	6	-2	.	-6	5
29	-5	8		4	-10	-4	19	4	-6	-8	5	-2
30	.	7		7	-11	3	14	-4	-6	3	6	-11
31	11	7		6		6		-10	-11		8	

Dot symbol entry indicates no data available for the day.

SOLAR WIND

Interplanetary Scintillations

NOVEMBER 1977

UCSD 74 MHZ SCINTILLATIONS

DAY	3C48		3C144		3C147		3C161		3C237		3C273		3C298		3C459	
	VEL	ERR	VEL	ERR	VEL	ERR	VEL	ERR	VEL	ERR	VEL	ERR	VEL	ERR	VEL	ERR
1	342	20	397	19							330	13	551	22		
2			317	26							248	22				
3											234	26	413	5		
4									424	16	267	4	515	16		
5									344	24	297	5	368	9		
7	325	3					391	40			291	13	559	25		
8	308	3							268	22	258	6	408	4		
9											295	29	259	5		
10											285	8	352	19	414	18
11			393	55			569	25	477	7	449	5	289	0	344	20
12											347	24	323	3	381	6
13	360	14	376	65							395	14	349	0		
14	483	47									439	26	407	10	443	60
15	356	40							523	44	462	11	498	4		
16			519	51							425	122	460	31		
17											470	0	439	21		
18											392	26	404	4		
19									293	19	401	6	436	5		
20			500	44							417	52	550	16		
21	379	23							451	43	331	5	607	12	396	16
22							303	73			307	10	591	18		
23											220	5	523	32		
24			389	14									337	7	277	25
25	350	4									362	6	393	29		
26	396	8	468	11	427	27	358	56	313	25	384	3	353	4	329	5
27	418	21	346	4	304	9	484	4	399	6	407	4	339	6	354	4
28							283	13			390	10	310	6		
29			435	100			229	34					299	0		
30	411	19					417	17			391	9	427	6	372	4

NOVEMBER	5				15				25			
	UT	LAT	DIST	DLON	UT	LAT	DIST	DLON	UT	LAT	DIST	DLON
3C48	7.	8.	1.28	-1.	6.	8.	1.27	-4.	6.	7.	1.26	-6.
3C144	11.	2.	1.24	9.	10.	1.	1.27	7.	10.	0.	1.29	4.
3C147	10.	9.	1.22	9.	9.	7.	1.24	7.	9.	6.	1.26	5.
3C161	12.	-4.	1.18	9.	12.	-5.	1.21	8.	11.	-6.	1.24	6.
3C237	16.	0.	0.95	17.	15.	0.	1.01	17.	15.	-1.	1.06	16.
3C273	18.	3.	0.62	52.	17.	1.	0.75	42.	17.	0.	0.85	32.
3C298	20.	46.	0.40	59.	19.	30.	0.50	56.	18.	20.	0.62	49.
3C459	4.	6.	1.21	-11.	4.	6.	1.17	-13.	3.	5.	1.13	-14.

Dot symbol entry indicates no data available for the day.

PROVISIONAL PROTON EVENT DATA, 22 NOVEMBER 1977

THE FOLLOWING DATA ARE FROM THE NOAA SATELLITE SMS-2. THE PROTON DETECTOR ENERGIES ARE:

P3	6-10	MeV
P4	18-38	"
P5	40-500	"
P6	84-150	"
P7	150-500	"

FLUXES ARE GIVEN AS (PROTONS CM^{-2} SEC^{-1} $STER^{-1}$). WHERE NO FLUXES ARE LISTED, THE SENSOR WAS AT BACKGROUND LEVELS.

TIME	P3	P4	P5	P6	P7
22 NOV 1000 UT		ALL SENSORS AT BACKGROUND			
1030 UT		0.6	2.3	0.1	0.1
1100 UT	0.2	1.5	33	0.5	2.6
1130 UT	0.9	6.3	86	12	4.5
1200 UT	3.6	18	119	14	4.9
1230 UT	7.5	36	139(MAX)	15(MAX)	4.7
1300 UT	20	56	139	15	5.1(MAX)
1500 UT	45	69(MAX)	106	10	2.8
1600 UT	60(MAX)	59	79	7.5	2.1
2300 UT	17	18	21	1.6	0.4
23 NOV 1600 UT	4.8	4.3	2.3	0.1	

OCTOBER 1977 DATA

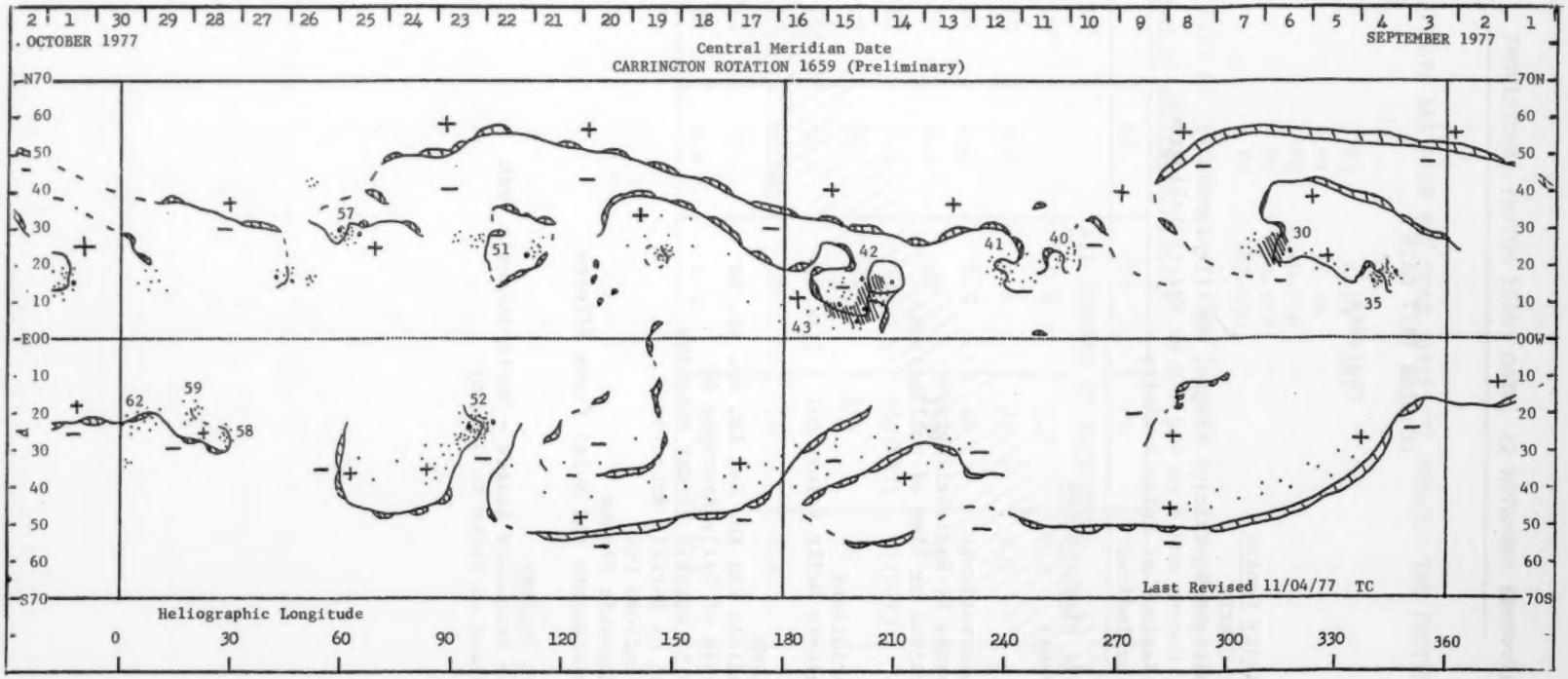
Contents

	Page
Daily Solar Activity Center	
Hα Synoptic Charts	28-29
X-ray, Magnetograms, Calcium Plages, Hα Filtergrams, Sunspots, Corona and 2 cm and 8.6 mm Spectroheliograms	30-91
Individual Regions of Solar Activity	92-99
Daily Calcium Indices	99
Sudden Ionospheric Disturbances	
Table of Events	100
Solar Radio Waves	
Spectral Observations	101-107
Selected Events by Radioheliograph (not received at time of publication)	
Cosmic Rays	
Chart of Variations	108-111
Neutron Monitors Daily Values	112
Geomagnetic Indices	
Table of Indices Kp, Kn, Ks, Km, Cp, Ap, aa	113
12-Month Table of Daily Averages Ap	114
Chart of Kp by Bartels 27-day Rotation	115
Chart of Dst by Bartels Rotation	116
Equatorial Indices Dst	117
Principal Magnetic Storms	118
Sudden Commencements and Solar Flare Effects	119
Radio Propagation Indices	
Transmission Frequency Ranges - North Atlantic Path	120-121
Quality Indices on Paths to Germany	122

28
Oct 77

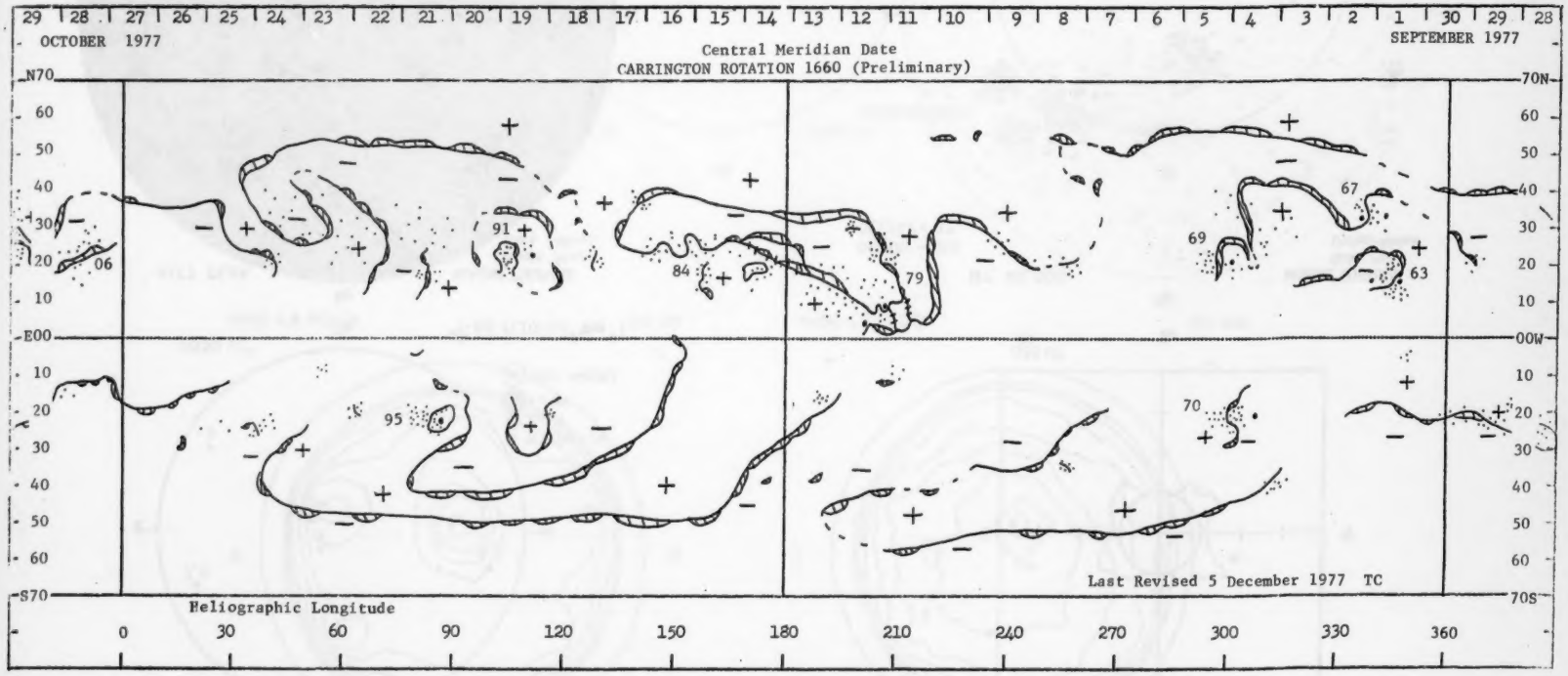
Hα SYNOPTIC CHART

CARRINGTON ROTATION 1659 (PRELIMINARY)



Hα SYNOPTIC CHART

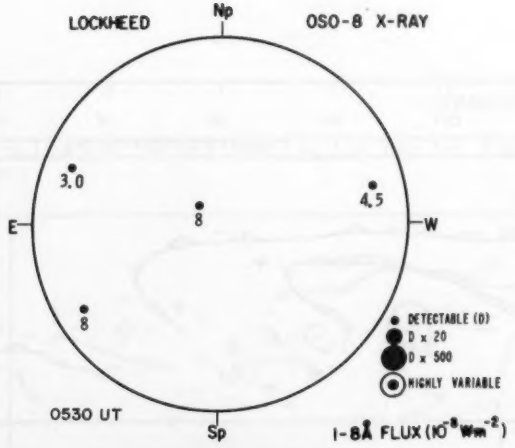
CARRINGTON ROTATION 1660 (PRELIMINARY)



29 Oct 77

OCTOBER 1, 1977 (P = 26.01, B_o = 6.71, L_o = 353.12)

LOCKHEED OSO-8 X-RAY

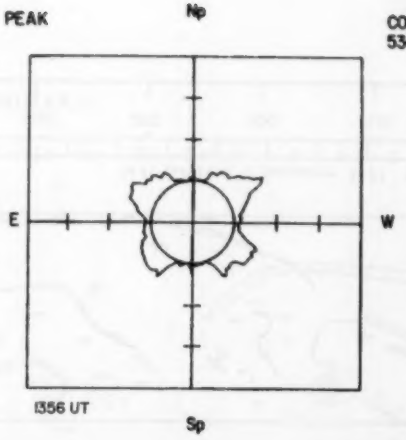


0530 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

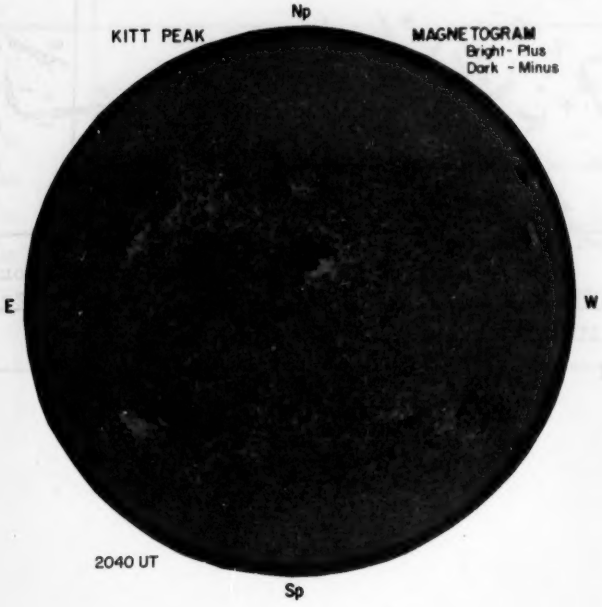
CORONA (1.15 $R_\odot$)
5303 Å



1356 UT

KITT PEAK

MAGNETOGRAM
Bright - Plus
Dark - Minus

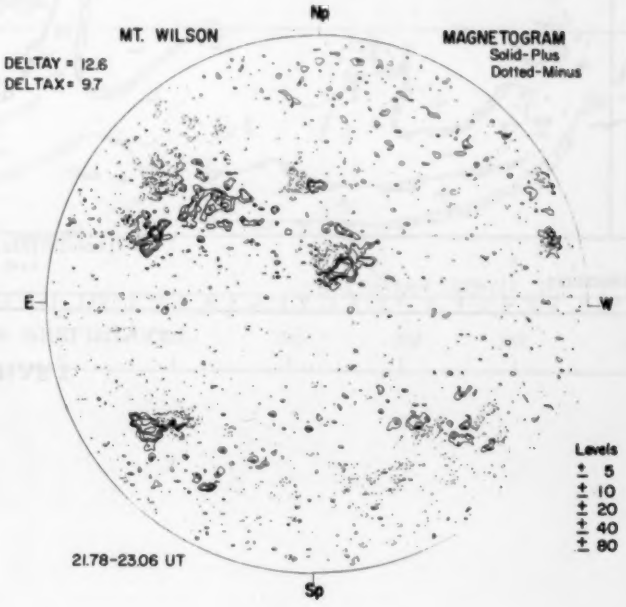


2040 UT

MT. WILSON

MAGNETOGRAM
Solid - Plus
Dotted - Minus

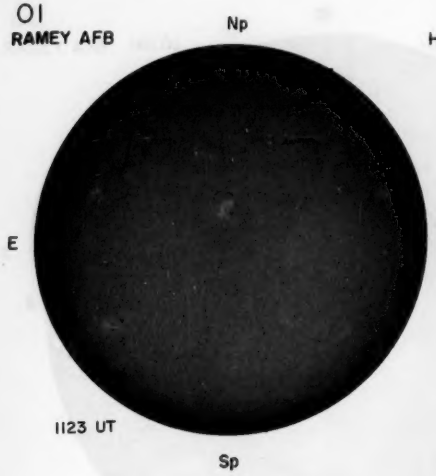
DELTAY = 12.6
DELTAX = 9.7



21.78-23.06 UT

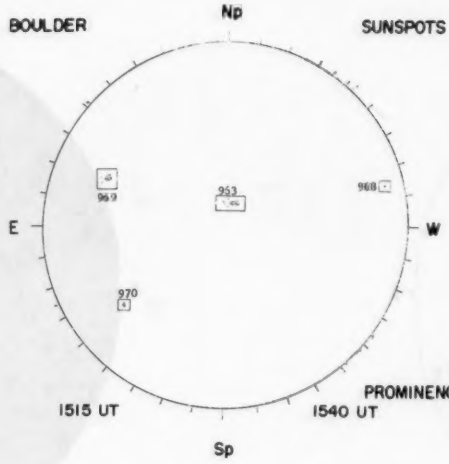
01

RAMEY AFB



1123 UT

Hα BOULDER



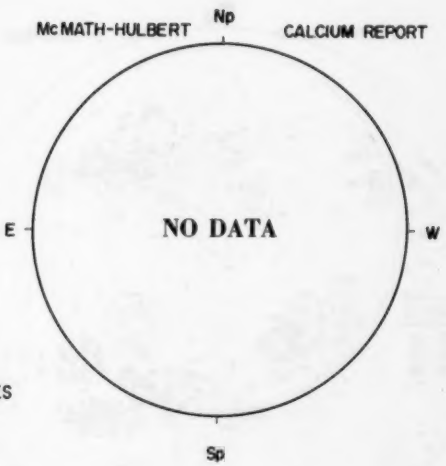
1515 UT

SUNSPOTS

PROMINENCES

1540 UT

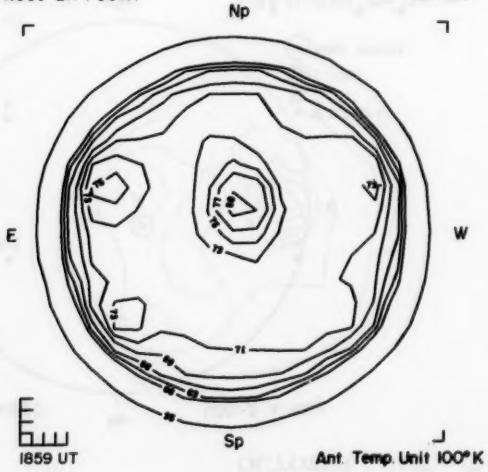
McMATH-HULBERT



CALCIUM REPORT

NOSC LA POSTA

2.0 CM

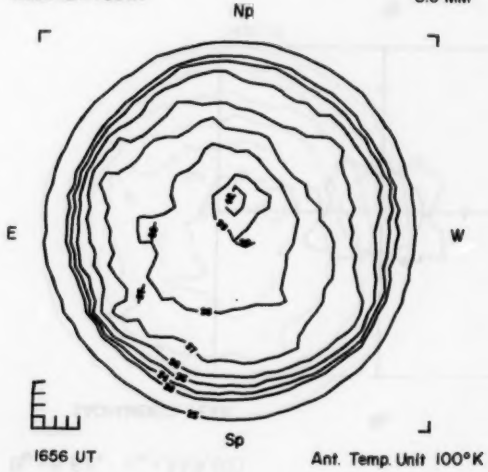


1859 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM



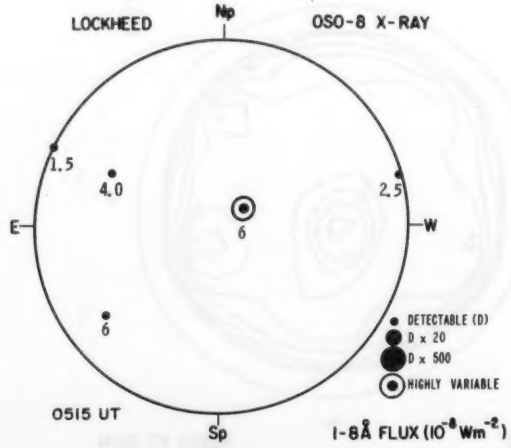
1656 UT

Ant. Temp. Unit 100°K

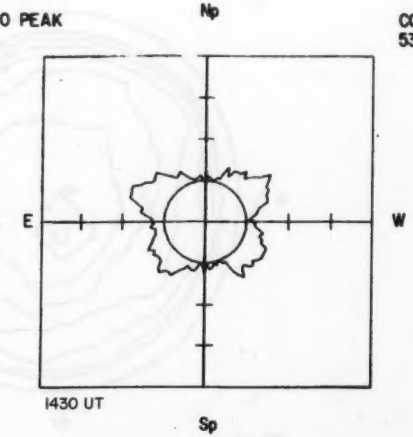
31
Oct 77

OCTOBER 2, 1977 (P = 26.07, B_0 = 6.66, L_0 = 339.92)

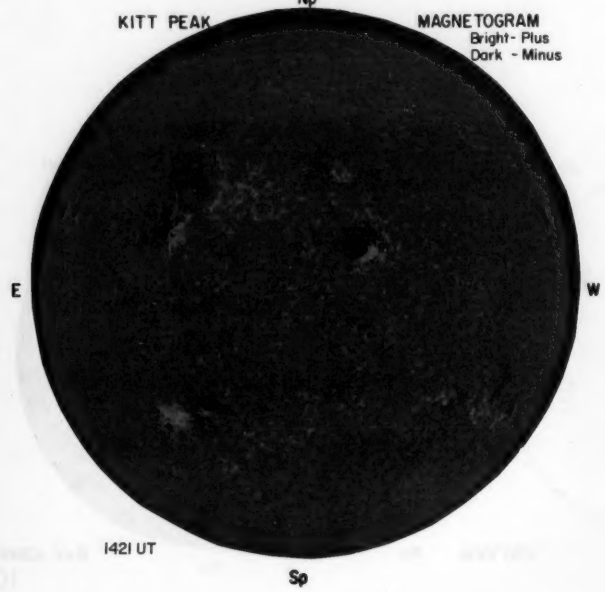
LOCKHEED OSO-8 X-RAY



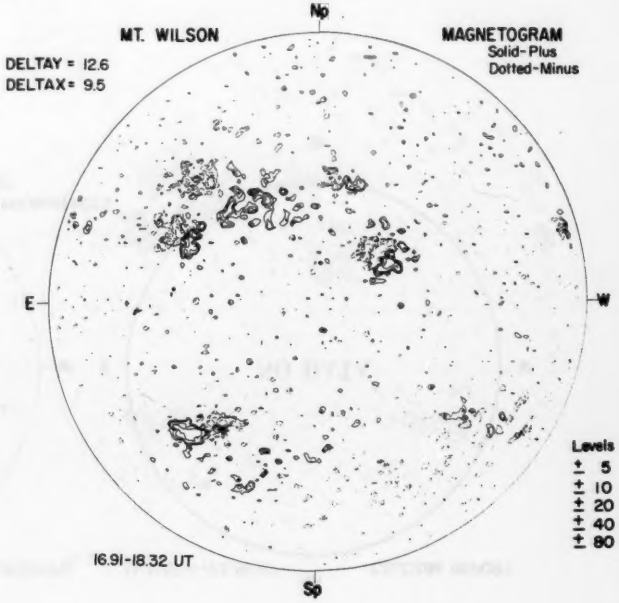
SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

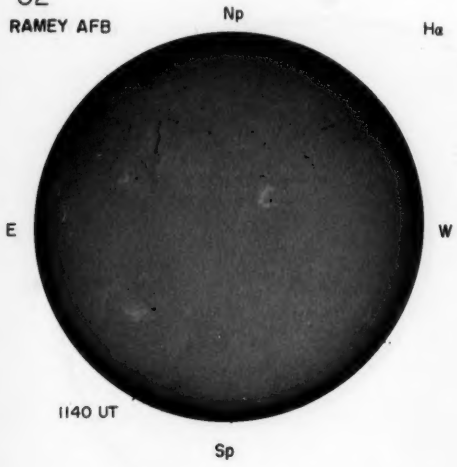


MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.6
DELTAX = 9.5



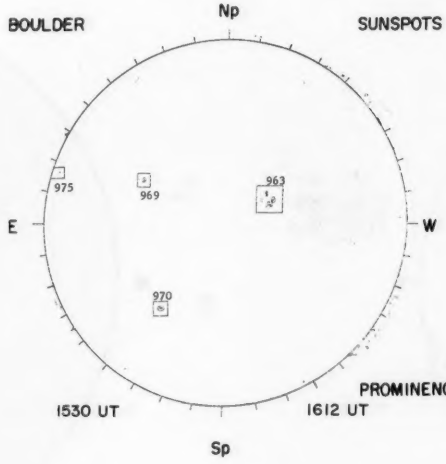
02

RAMEY AFB



1140 UT

Hα BOULDER

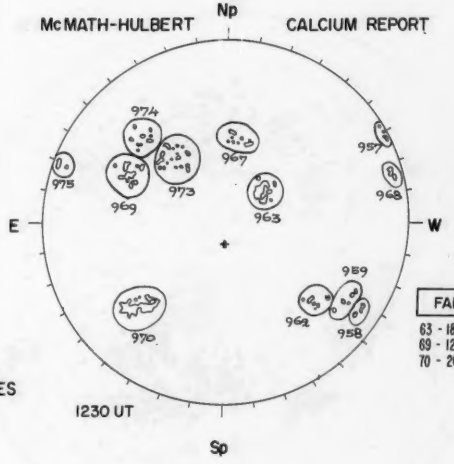


1530 UT

SUNSPOTS

1612 UT

McMATH-HULBERT



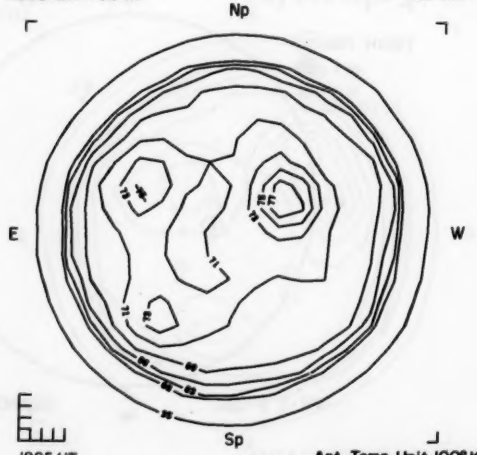
1230 UT

CALCIUM REPORT

FAIR	D
63 - 1800 - 35	
69 - 1200 - 30	
70 - 2000 - 30	

PROMINENCES

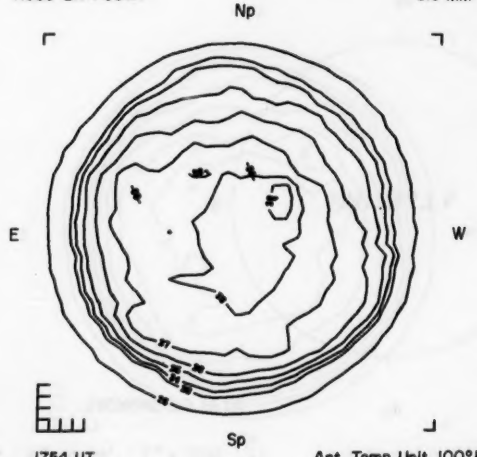
NOSC LA POSTA 2.0 CM



1905 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

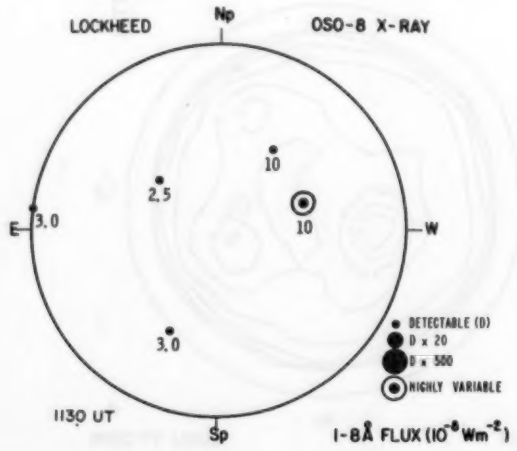


1754 UT

Ant. Temp. Unit 100°K

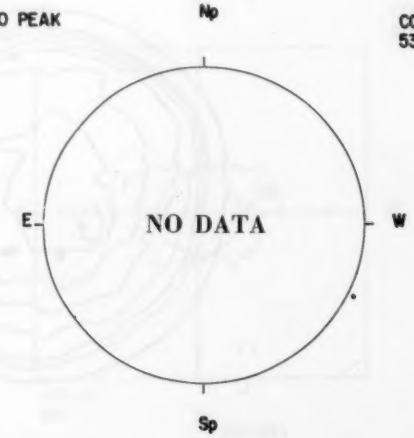
OCTOBER 3, 1977 (P = 26.13, B_o = 6.61, L_o = 326.72)

LOCKHEED OSO-8 X-RAY

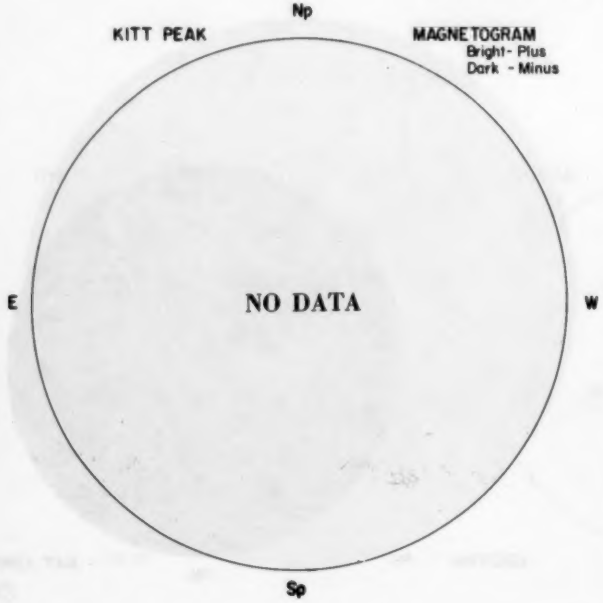


SACRAMENTO PEAK

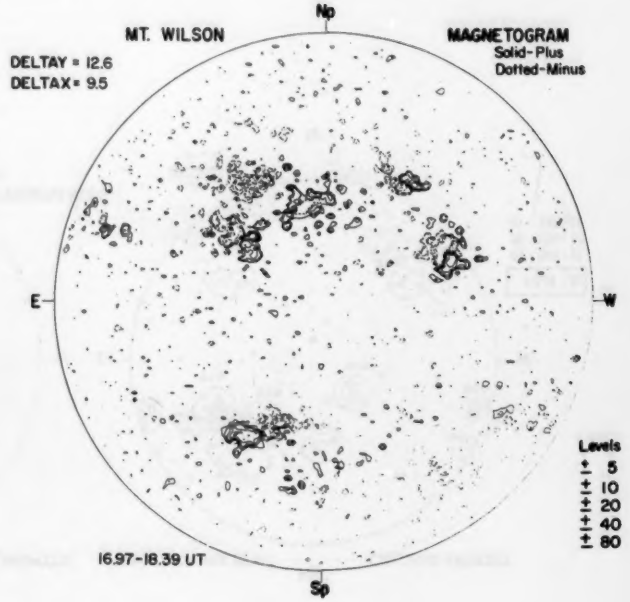
CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

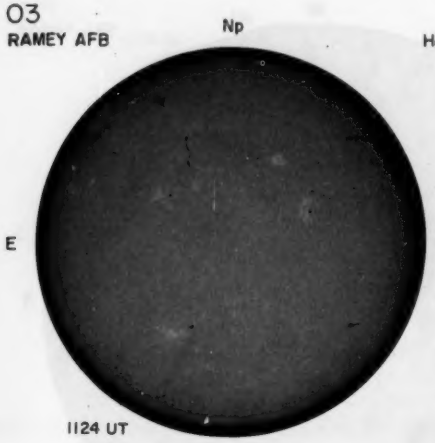


MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.6
DELTAX = 9.5



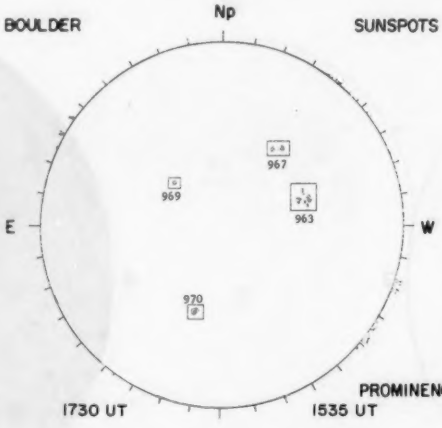
03

RAMEY AFB



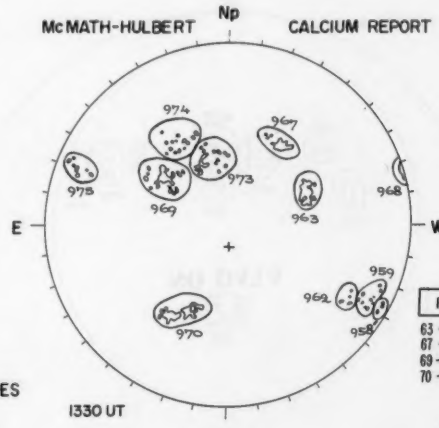
1124 UT

Hα BOULDER



1730 UT

SUNSPOTS



1535 UT

McMATH-HULBERT

1330 UT

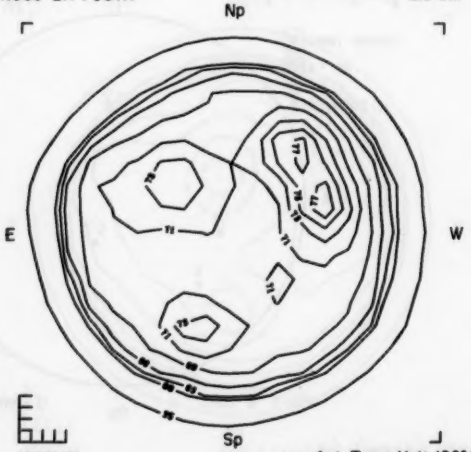
CALCIUM REPORT

FAIR	S

63 - 1500 - 3.5
67 - 0800 - 3.5
69 - 1200 - 3.0
70 - 2000 - 3.0

PROMINENCES

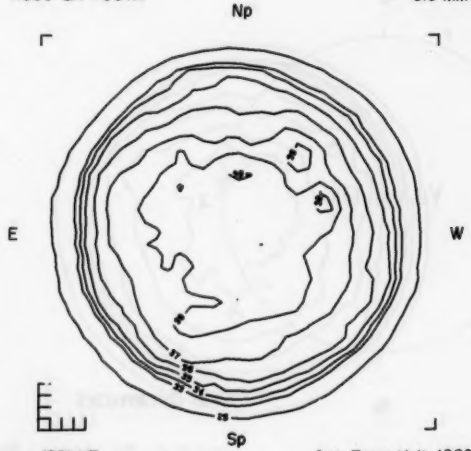
NOSC LA POSTA 2.0 CM



1948 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM



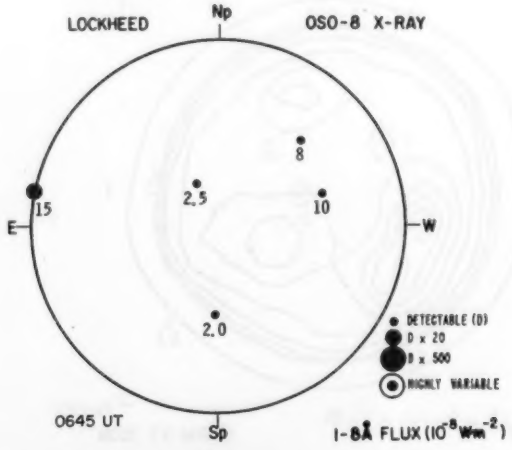
1821 UT

Ant. Temp. Unit 100°K

35
Oct 77

OCTOBER 4, 1977 (P = 26.18, B_o = 6.56, L_o = 313.53)

LOCKHEED OSO-8 X-RAY

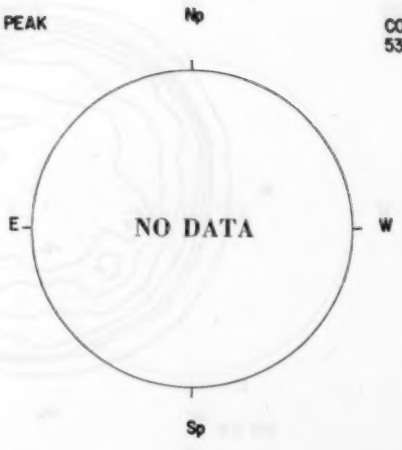


0645 UT

1-8Å FLUX (10^{-8} Wm^{-2})

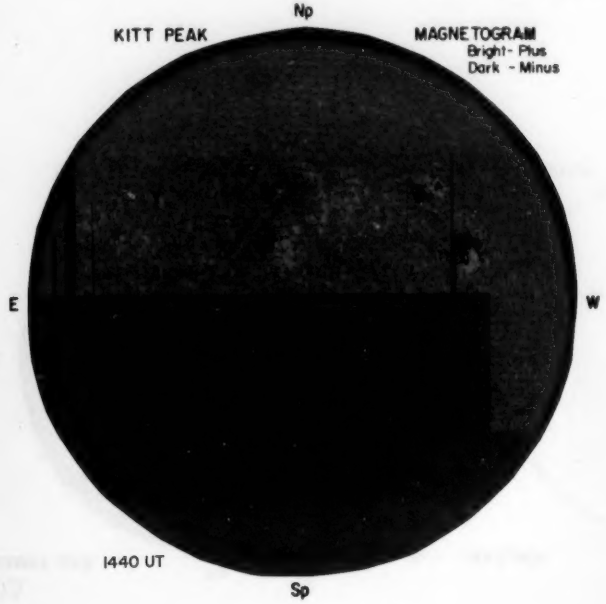
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

MAGNETOGRAM
Bright - Plus
Dark - Minus

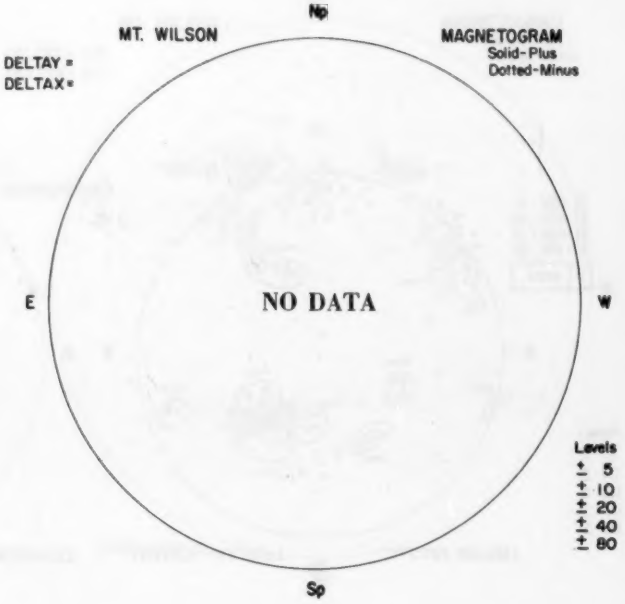


1440 UT

MT. WILSON

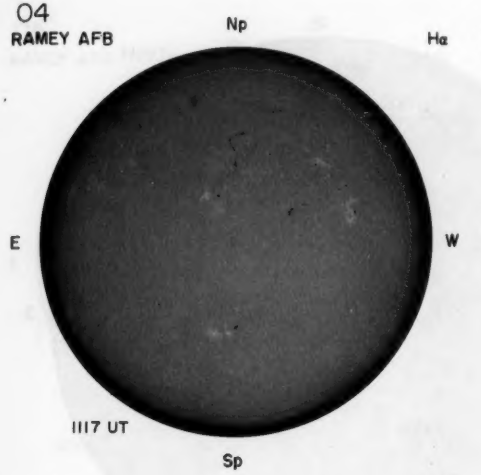
DELTAY =
DELTAX =

MAGNETOGRAM
Solid - Plus
Dotted - Minus

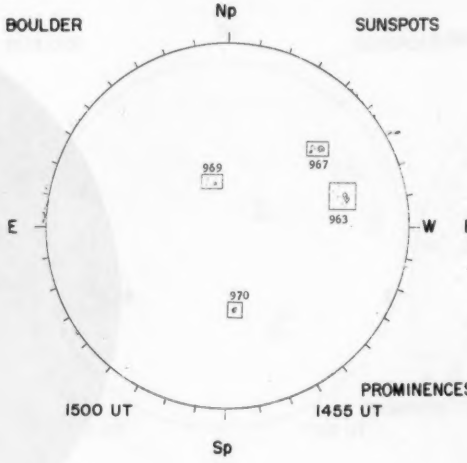


04

RAMEY AFB



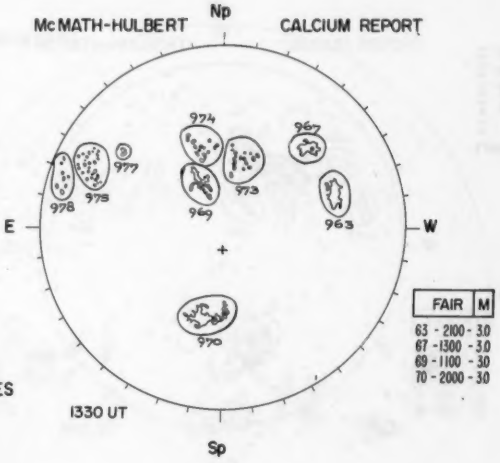
Hα BOULDER



SUNSPOTS

PROMINENCES

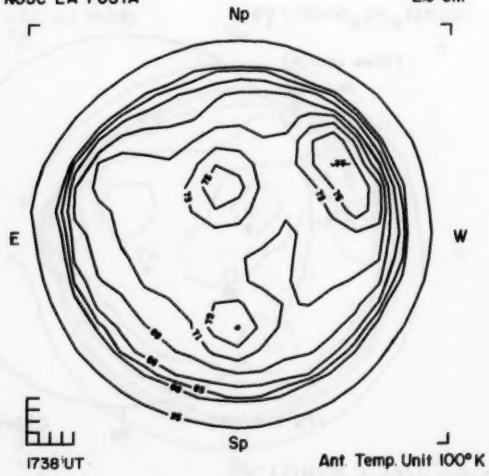
McMATH-HULBERT



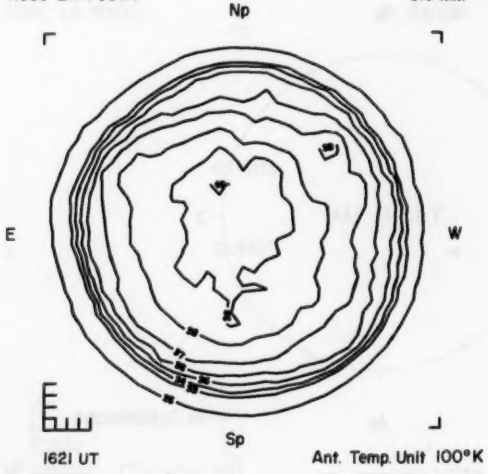
CALCIUM REPORT

FAIR	M
63 - 2100 - 30	
67 - 1300 - 30	
69 - 1100 - 30	
70 - 2000 - 30	

NOSC LA POSTA 2.0 CM

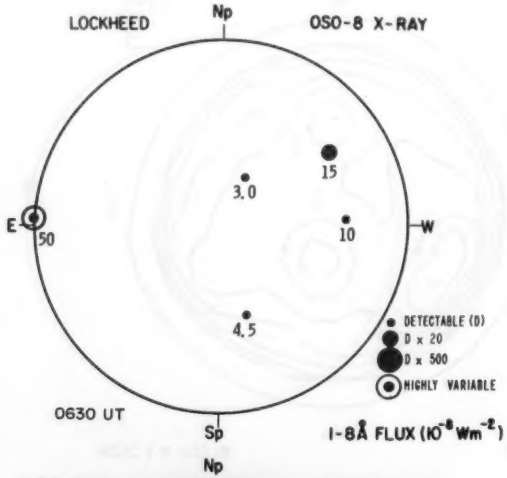


NOSC LA POSTA 8.6 MM



OCTOBER 5, 1977 (P = 26.22, B_0 = 6.50, L_0 = 300.34)

LOCKHEED OSO-8 X-RAY

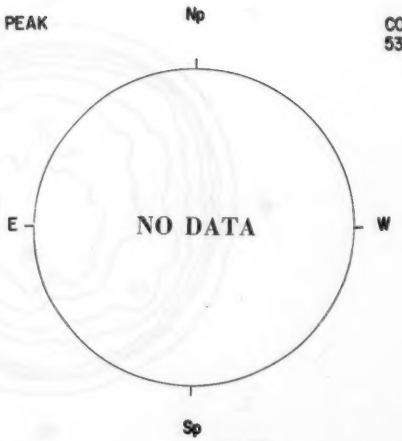


0630 UT

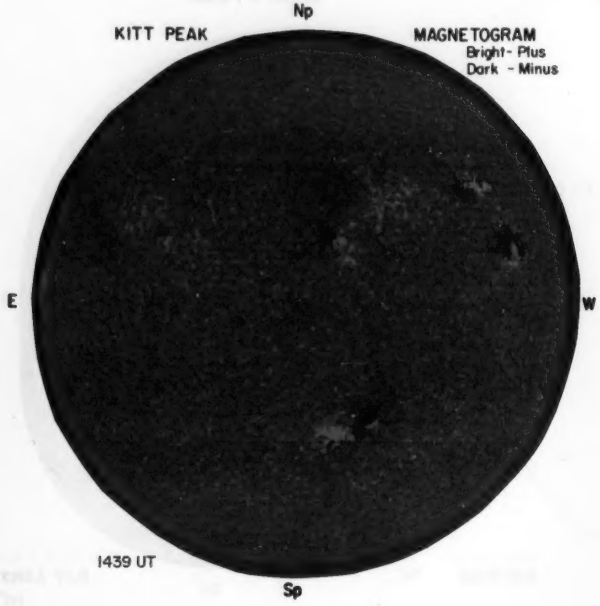
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

CORONA (1.15 R_0)
5303 Å



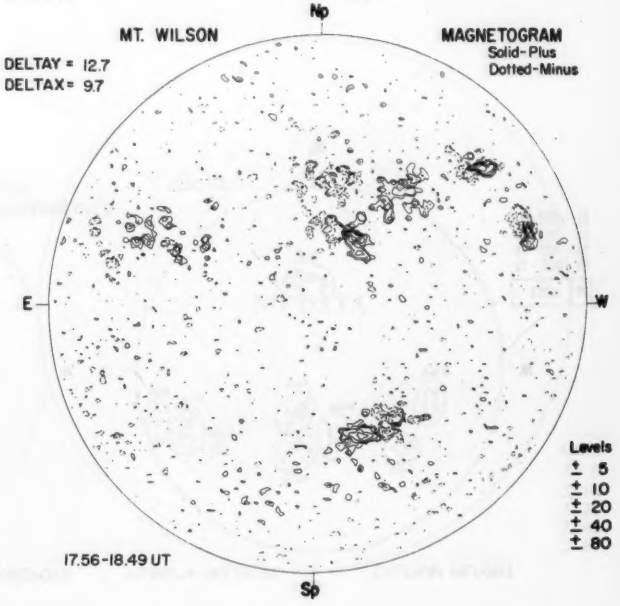
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1439 UT

MT. WILSON MAGNETOGRAM
Solid-Plus
Dotted-Minus

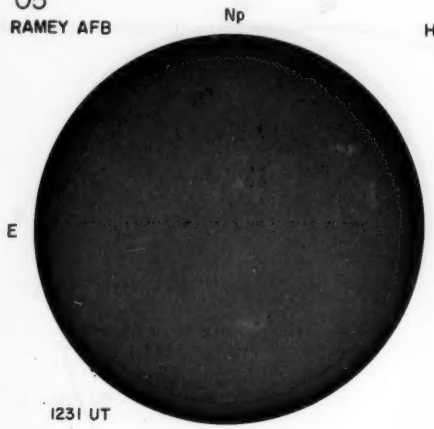
DELTAY = 12.7
DELTAX = 9.7



17.56-18.49 UT

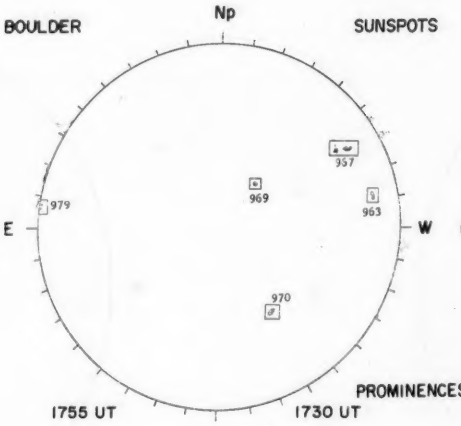
05

RAMEY AFB



1231 UT

Hα BOULDER



1755 UT

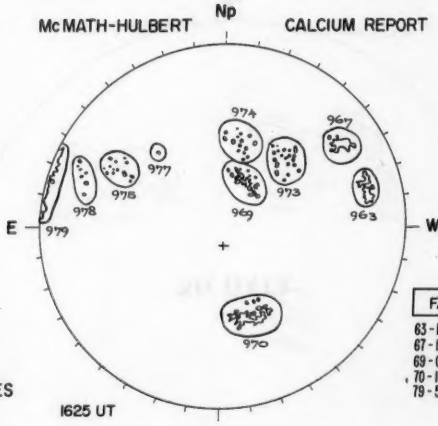
SUNSPOTS

PROMINENCES

1730 UT

McMATH-HULBERT

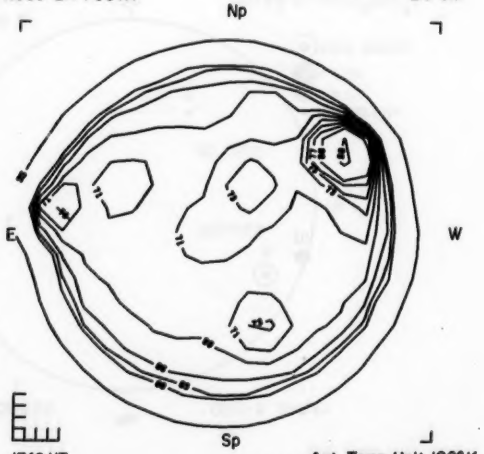
CALCIUM REPORT



1625 UT

FAIR	M
63 - 1900 - 30	
67 - 1500 - 35	
69 - 0900 - 2.5	
70 - 1900 - 3.0	
79 - 5000 - 3.5	

NOSC LA POSTA 2.0 CM



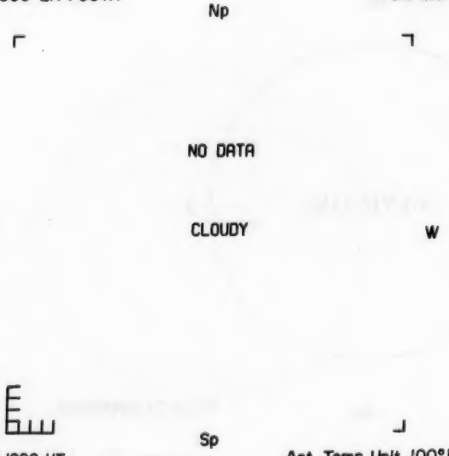
1749 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

NO DATA

CLOUDY

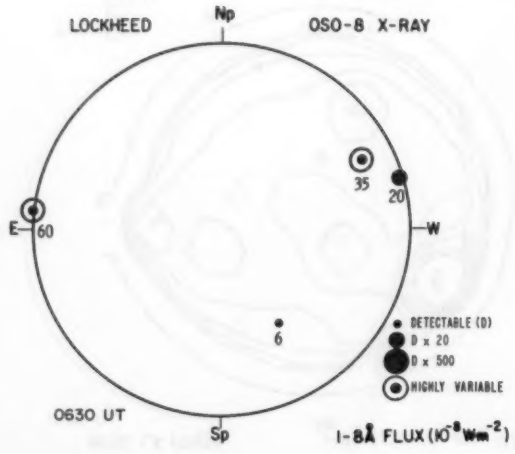


1922 UT

Ant. Temp. Unit 100°K

OCTOBER 6, 1977 (P = 26.26, B_o = 6.45, L_o = 287.14)

LOCKHEED OSO-8 X-RAY



0630 UT

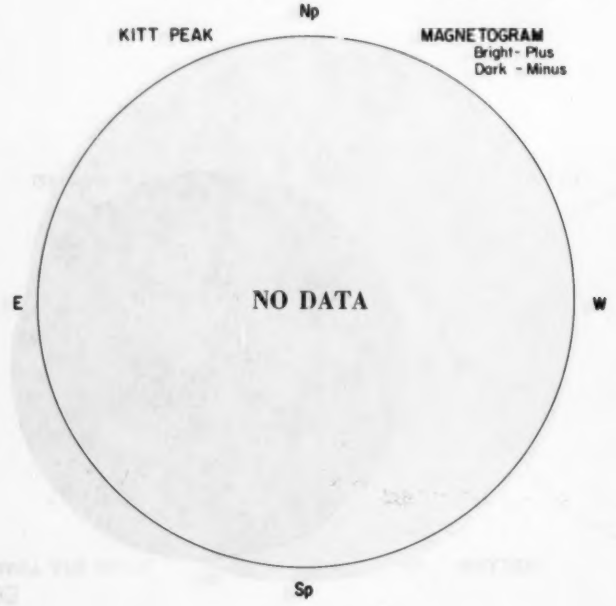
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

KITT PEAK

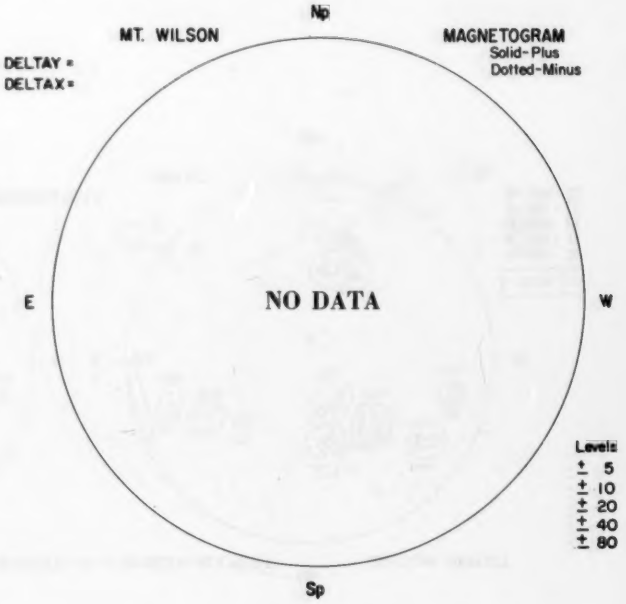
MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON

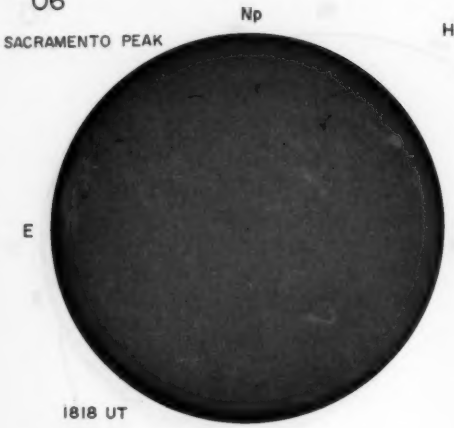
DELTAY =
DELTAX =

MAGNETOGRAM
Solid - Plus
Dotted - Minus



06

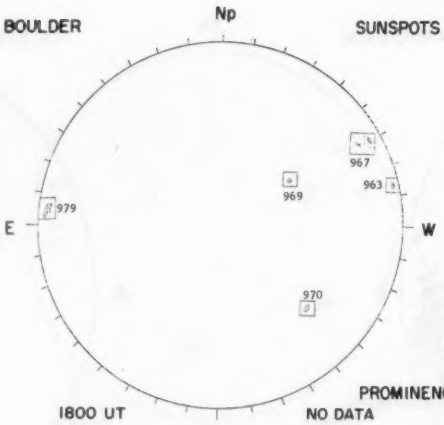
SACRAMENTO PEAK



1818 UT

Hα

BOULDER



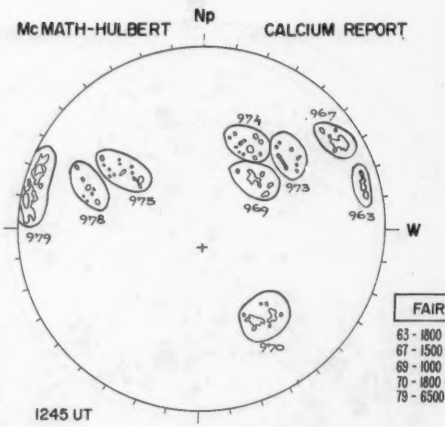
1800 UT

SUNSPOTS

NO DATA

PROMINENCES

McMATH-HULBERT



1245 UT

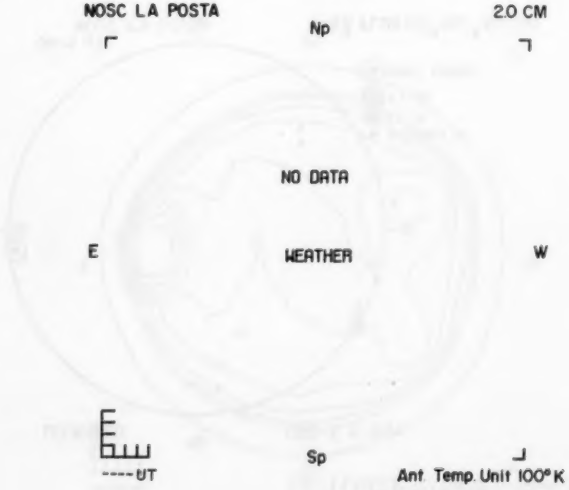
CALCIUM REPORT

FAIR	S

63 - 1800 - 3.0
67 - 1500 - 3.5
69 - 1000 - 2.5
70 - 1800 - 3.0
79 - 6500 - 3.5

NOSC LA POSTA

2.0 CM

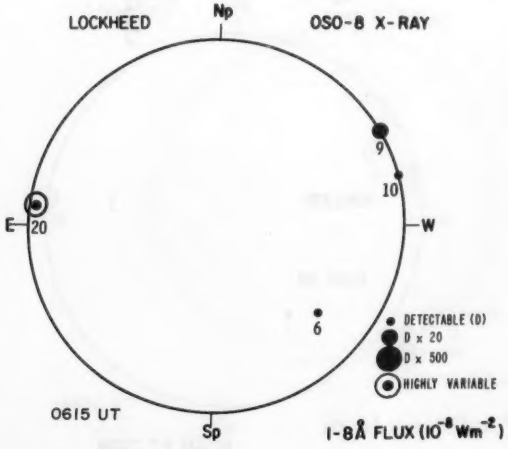


NOSC LA POSTA

8.6 MM

OCTOBER 7, 1977 (P = 26.29, B_o = 6.39, L_o = 273.95)

LOCKHEED OSO-8 X-RAY

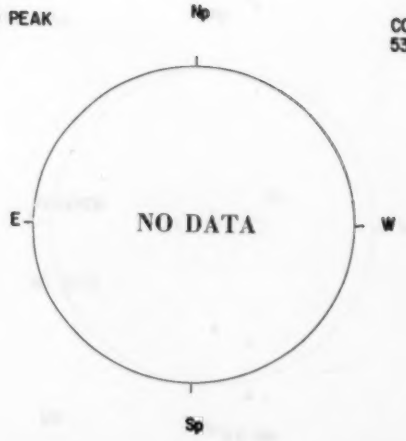


0615 UT

1-8Å FLUX (10^{-8} Wm^{-2})

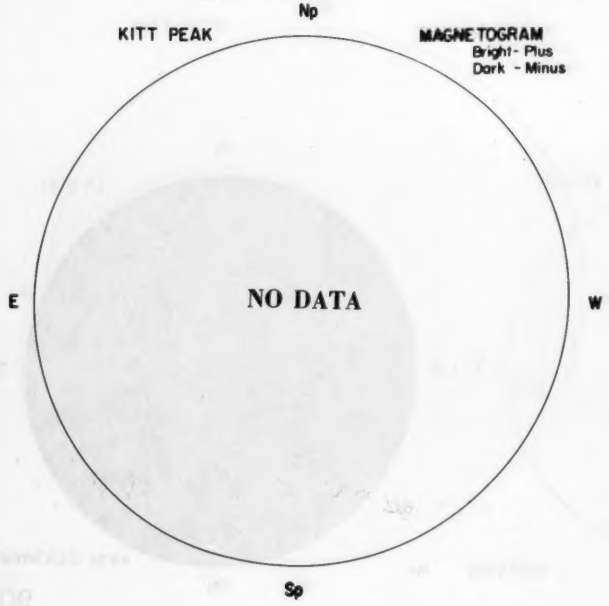
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

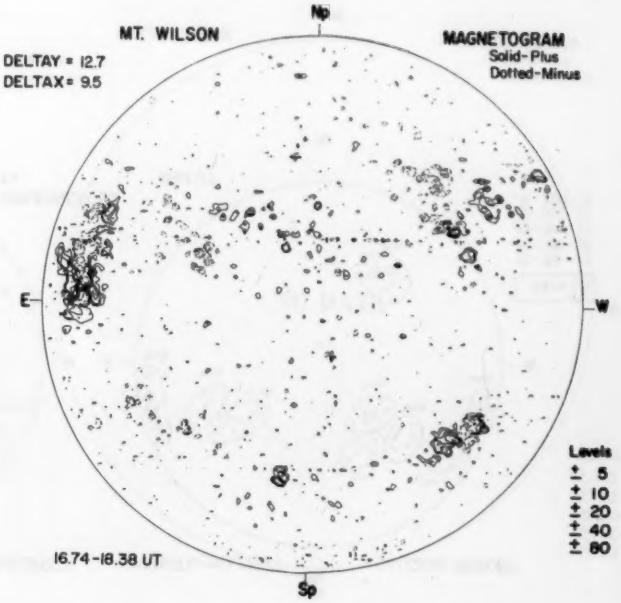
MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON

DELTAY = 12.7
DELTAX = 9.5

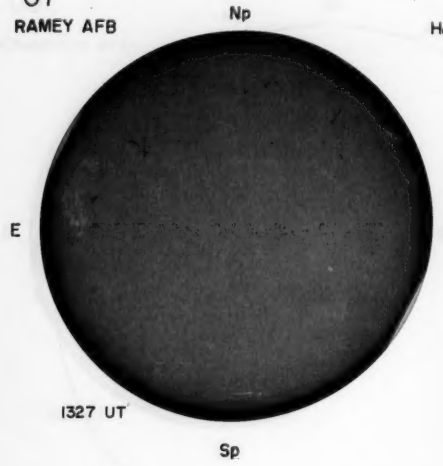
MAGNETOGRAM
Solid - Plus
Dotted - Minus



16.74 - 18.38 UT

07

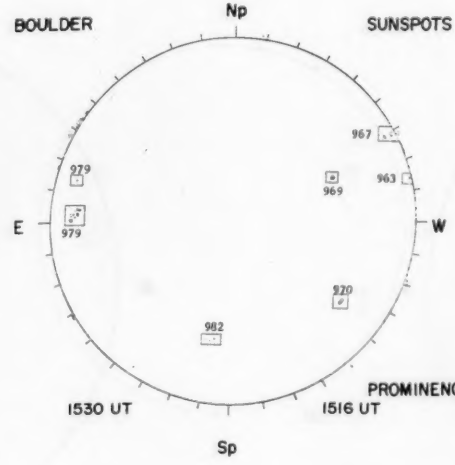
RAMEY AFB



1327 UT

Hα

BOULDER

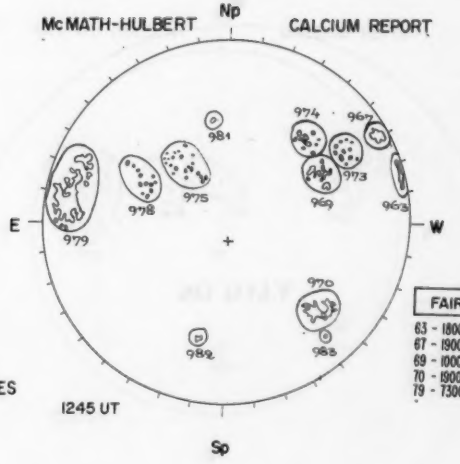


1530 UT

SUNSPOTS

1516 UT

McMATH-HULBERT



1245 UT

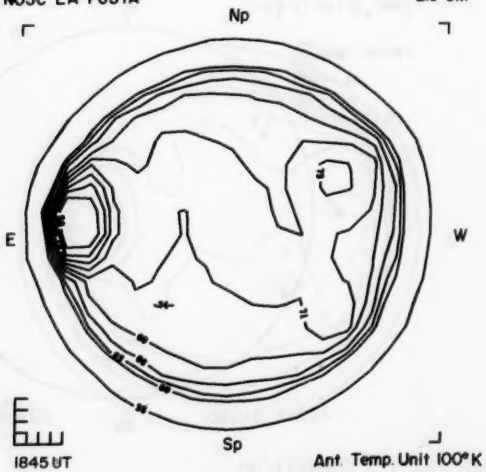
CALCIUM REPORT

FAIR	S
63 - 1800 - 3.0	
67 - 1900 - 3.5	
69 - 1000 - 2.5	
70 - 1900 - 3.0	
79 - 7300 - 3.5	

PROMINENCES

NOSC LA POSTA

2.0 CM

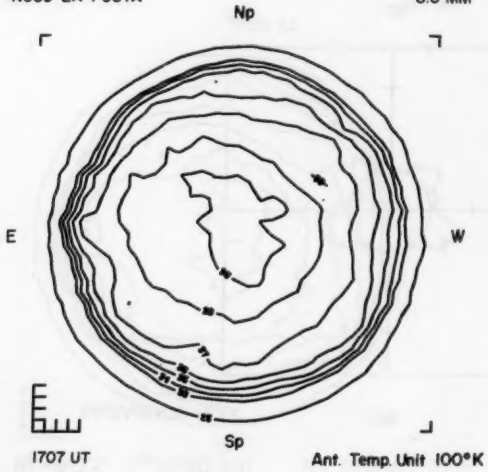


1845 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

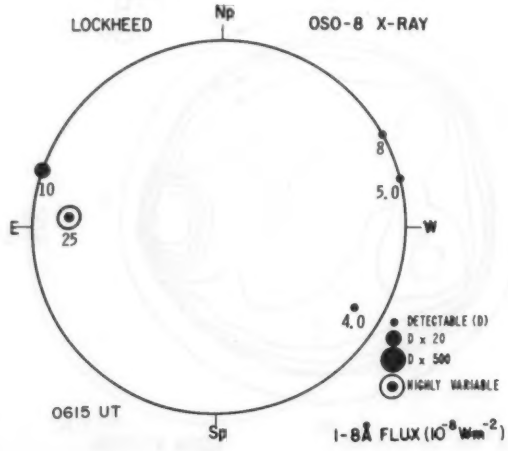
8.6 MM

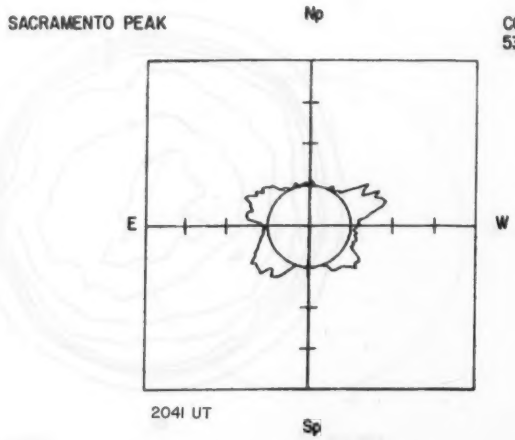


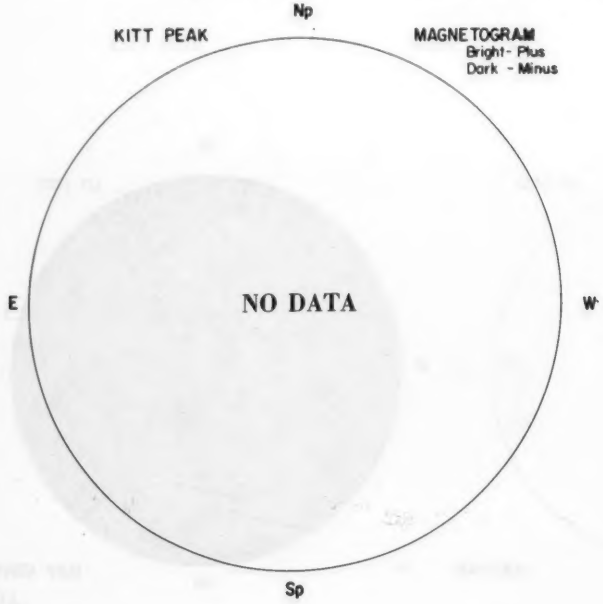
1707 UT

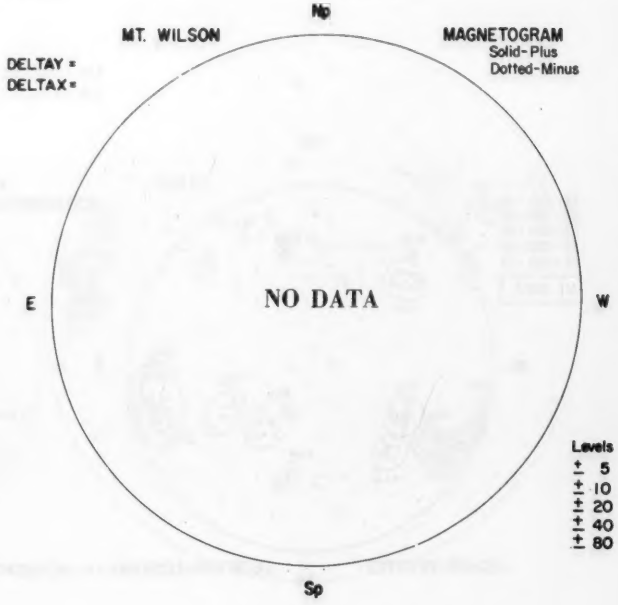
Ant. Temp. Unit 100°K

OCTOBER 8, 1977 (P = 26.31, B_o = 6.33, L_o = 260.75)



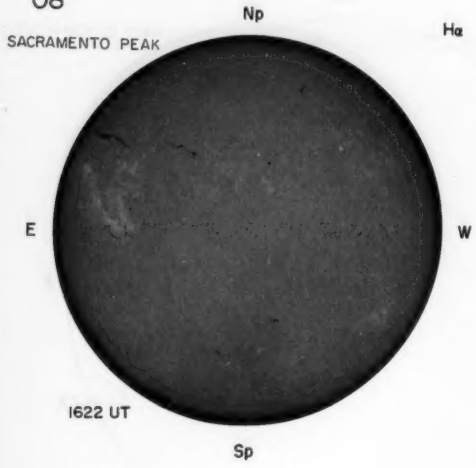




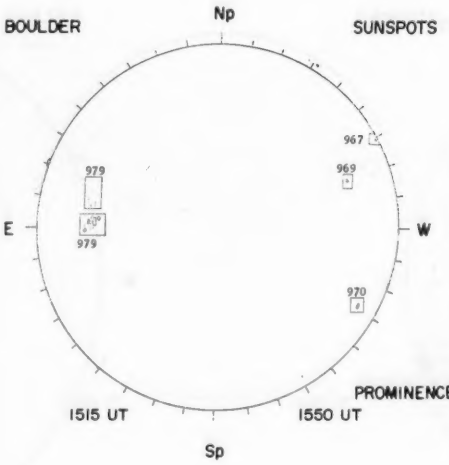


08

SACRAMENTO PEAK



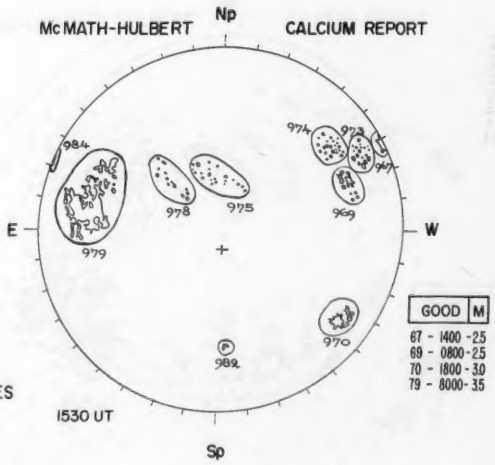
Hα BOULDER



SUNSPOTS

McMATH-HULBERT

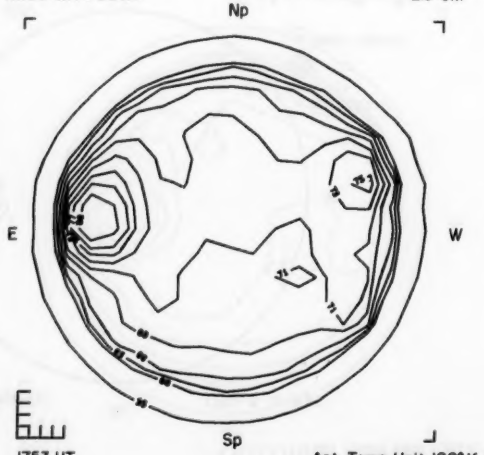
CALCIUM REPORT



PROMINENCES

GOOD	M
67 - 1400 - 25	
69 - 0800 - 25	
70 - 1800 - 30	
79 - 8000 - 35	

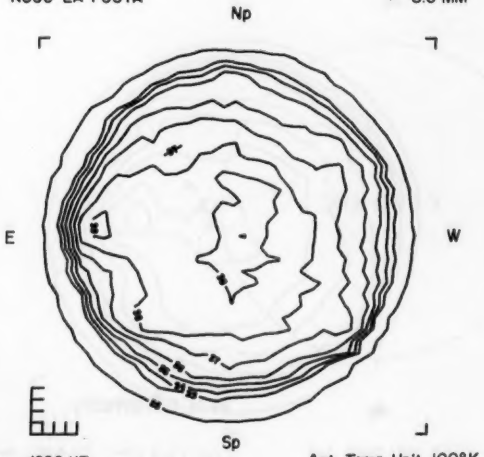
NOSC LA POSTA 2.0 CM



1753 UT

Ant. Temp. Unit 100°K

NOSC° LA POSTA 8.6 MM

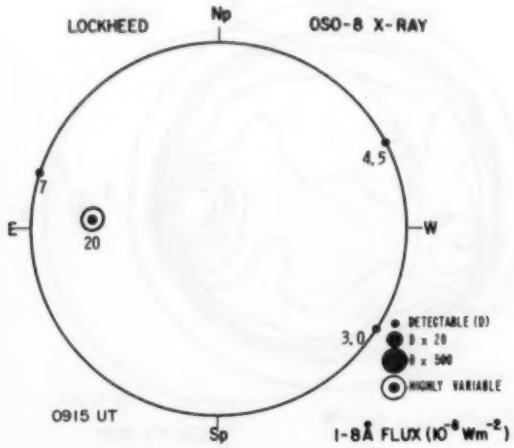


1628 UT

Ant. Temp. Unit 100°K

OCTOBER 9, 1977 (P = 26.32, B_o = 6.27, L_o = 247.56)

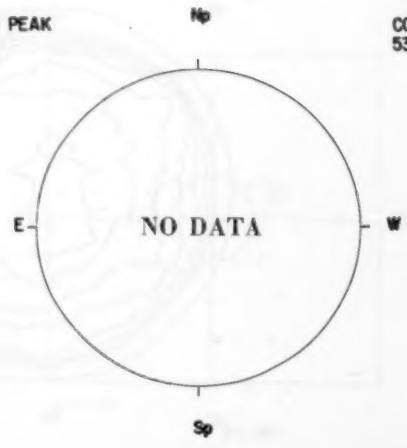
LOCKHEED OSO-8 X-RAY



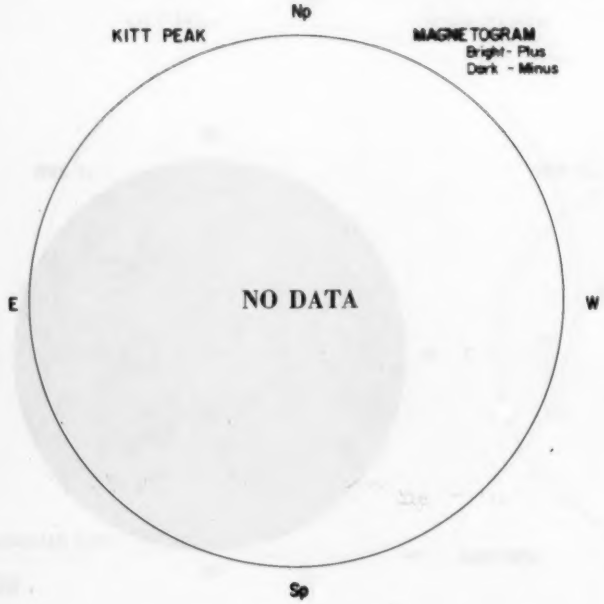
0915 UT

1-8Å FLUX (10^{-6} Wm^{-2})

SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å

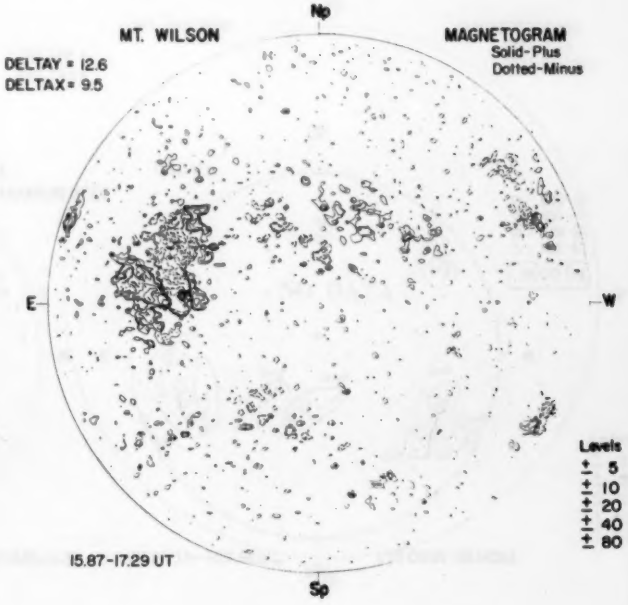


KITT PEAK MAGNETOGRAM Bright - Plus Dark - Minus



MT. WILSON MAGNETOGRAM Solid - Plus Dotted - Minus

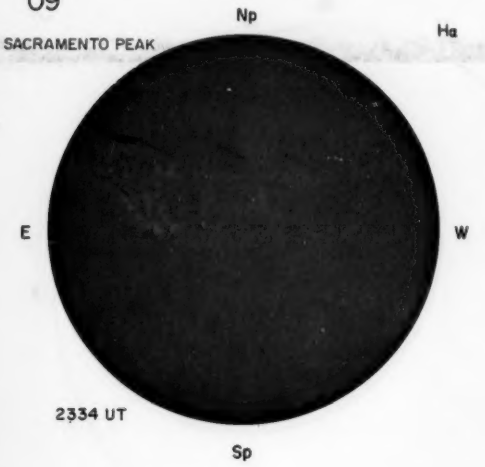
DELTAY = 12.6
DELTAX = 9.5



15.87-17.29 UT

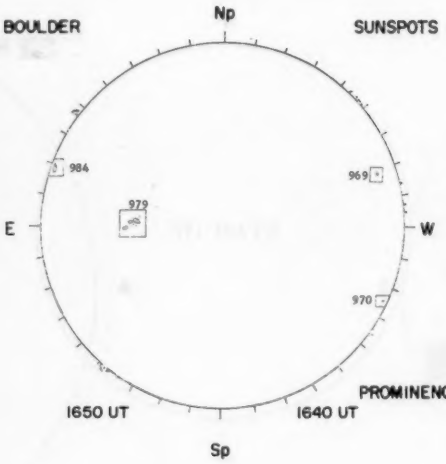
09

SACRAMENTO PEAK



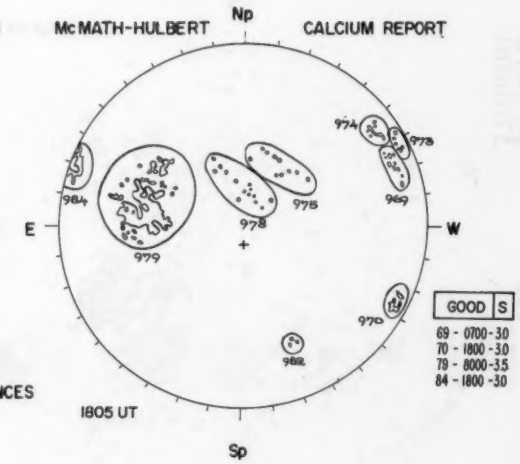
2334 UT

Hα BOULDER



1650 UT

SUNSPOTS



1640 UT

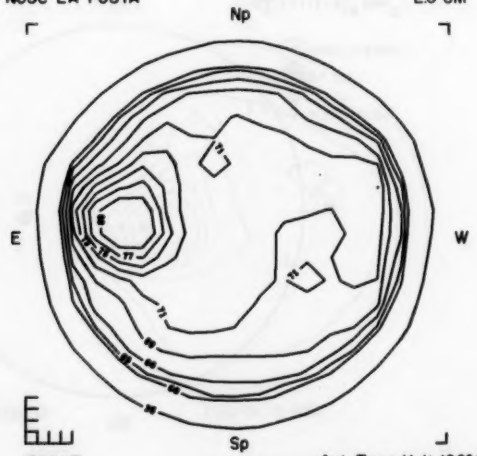
McMATH-HULBERT

1805 UT

CALCIUM REPORT

PROMINENCES

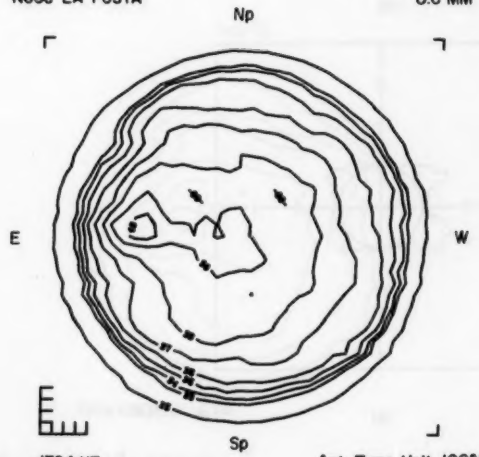
NOSC LA POSTA 2.0 CM



1805 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

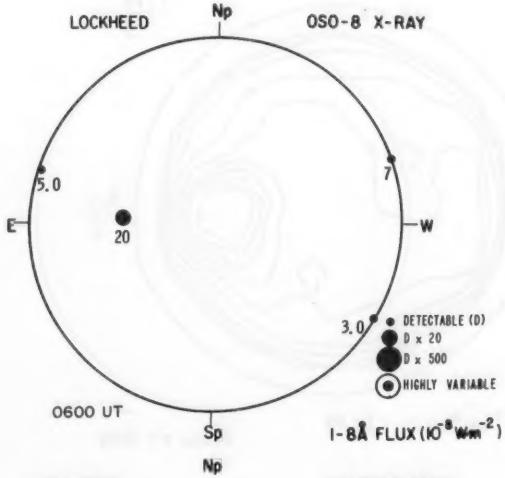


1704 UT

Ant. Temp. Unit 100°K

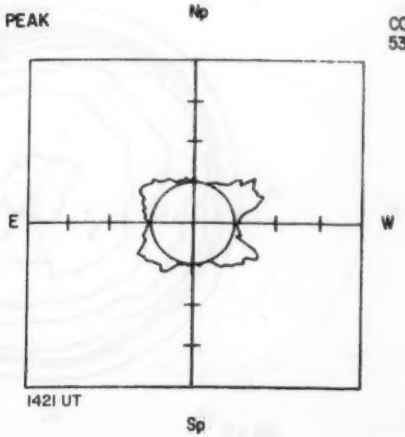
OCTOBER 10, 1977 (P = 26.33, B_o = 6.20, L_o = 234.37)

LOCKHEED OSO-8 X-RAY

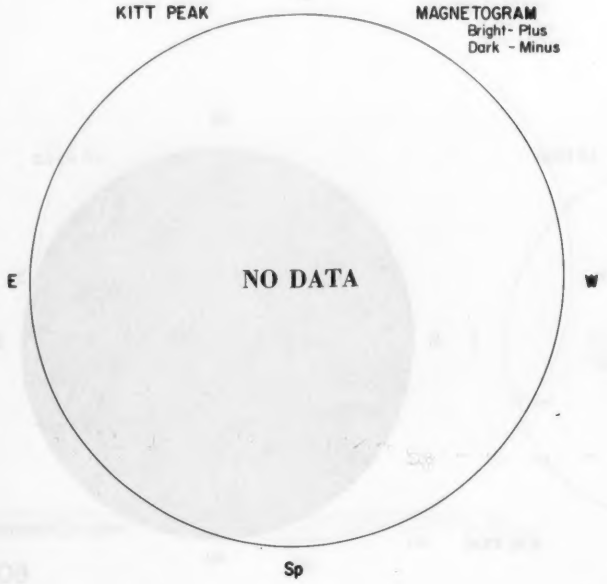


1-8Å FLUX (10^{-8} Wm^{-2})

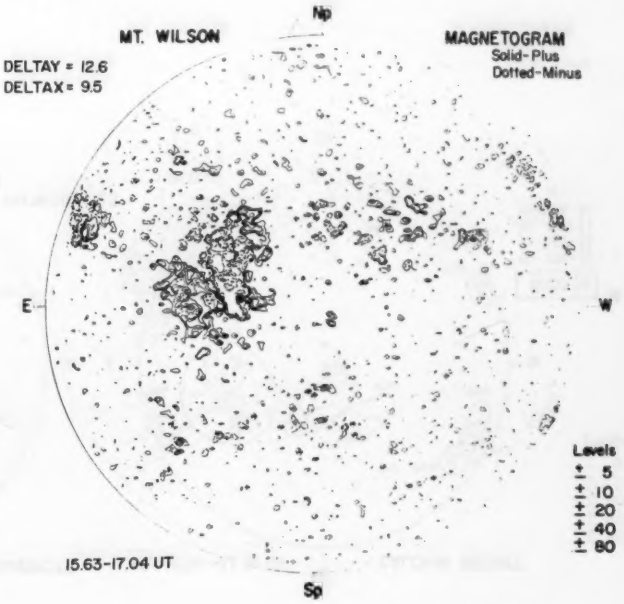
SACRAMENTO PEAK



KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

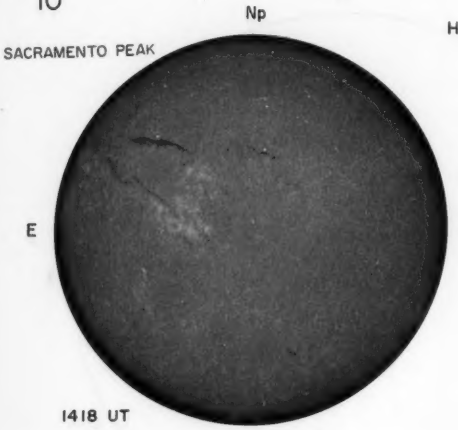


MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.6
DELTAX = 9.5



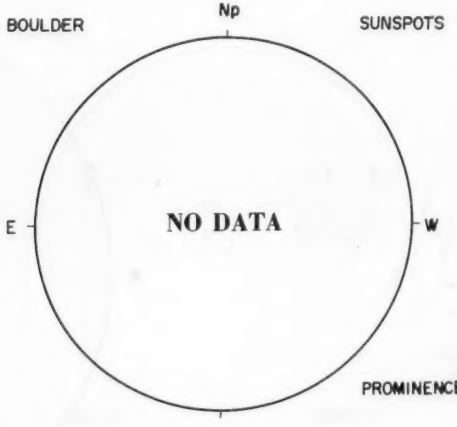
10

SACRAMENTO PEAK



1418 UT

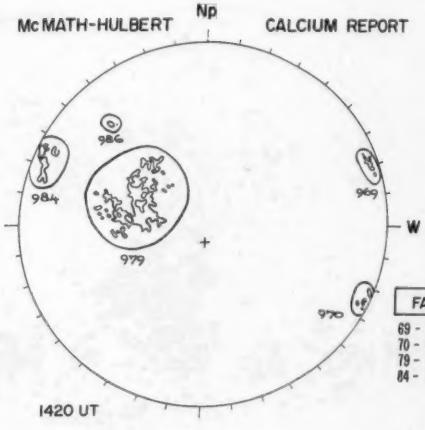
Hα BOULDER



SUNSPOTS

PROMINENCES

McMATH-HULBERT



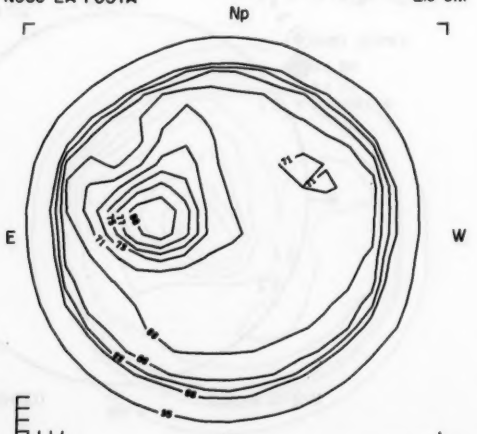
1420 UT

CALCIUM REPORT

FAIR	S

69 - 0700-30
70 - 1400-30
79 - 7500-35
84 - 3000-30

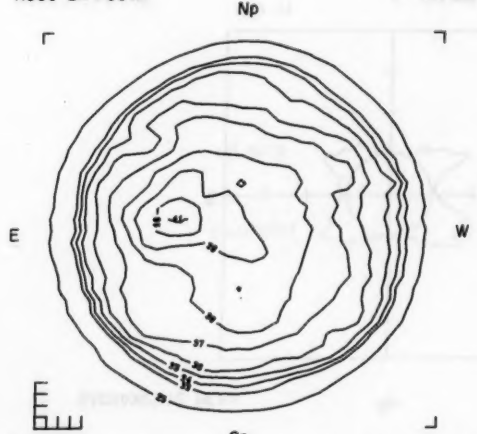
NOSC LA POSTA 2.0 CM



1802 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

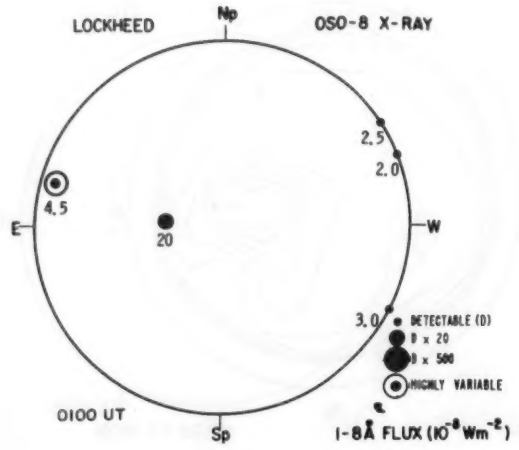


1654 UT

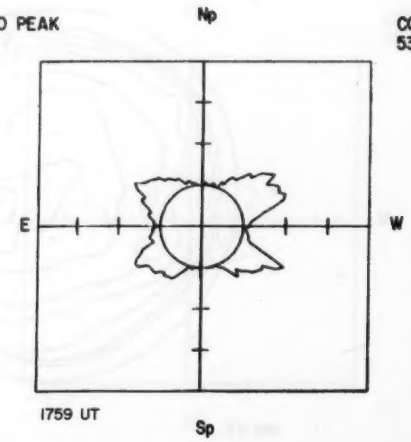
Ant. Temp. Unit 100°K

OCTOBER 11, 1977 (P = 26.33, B_o = 6.14, L_o = 221.18)

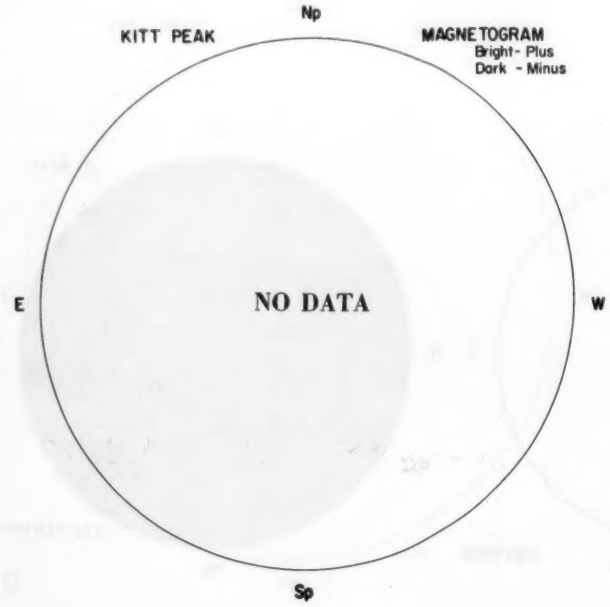
LOCKHEED OSO-8 X-RAY



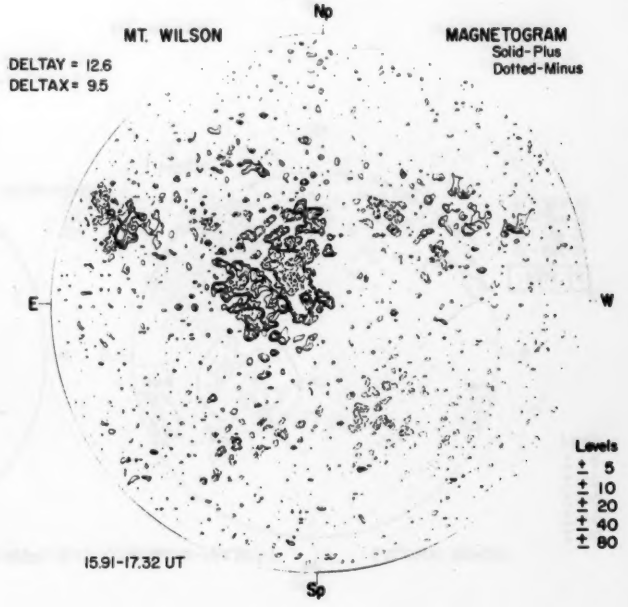
SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å

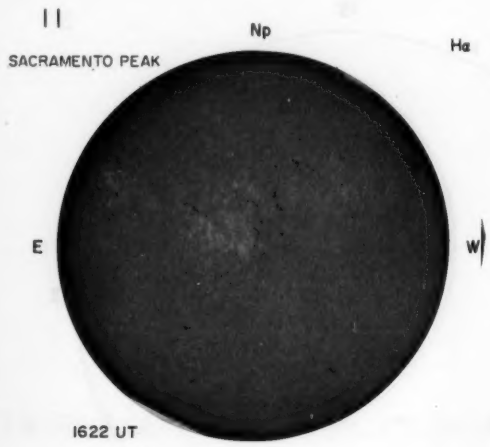


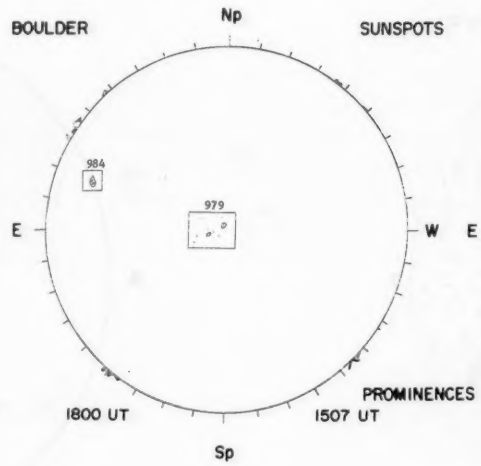
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

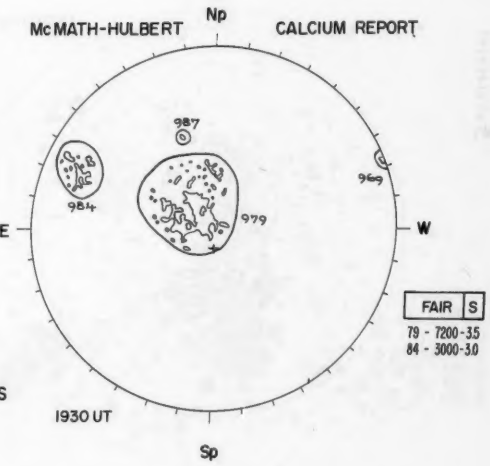


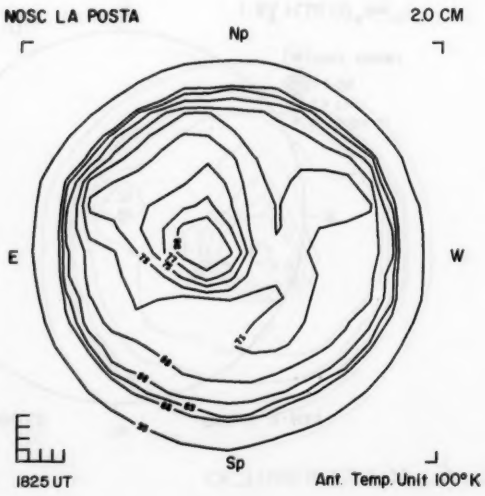
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.6
DELTAX = 9.5




Np
SACRAMENTO PEAK
Hα
E
W
1622 UT
Sp


Np
BOULDER
SUNSPOTS
984
979
E
W
1800 UT
1507 UT
Sp

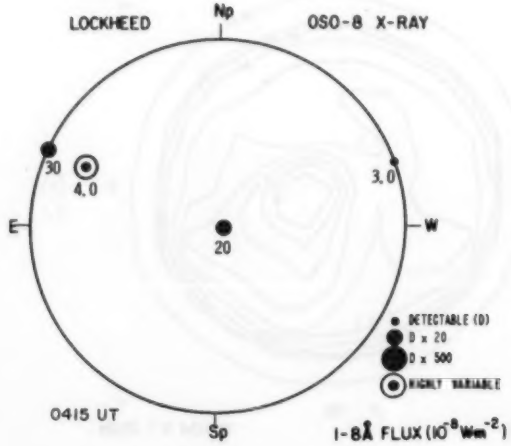

Np
McMATH-HULBERT
CALCIUM REPORT
987
984
979
969
E
W
FAIR S
79 - 7200-35
84 - 3000-30
PROMINENCES
1930 UT
Sp


NOSC LA POSTA
2.0 CM
Np
E
W
Sp
1825 UT
Ant. Temp. Unit 100°K

NOSC LA POSTA
8.6 MM
Np
NO DATA
EQUIPMENT
E
W
Sp
---- UT
Ant. Temp. Unit 100°K

OCTOBER 12, 1977 (P = 26.32, B_o = 6.07, L_o = 207.99)

LOCKHEED OSO-8 X-RAY

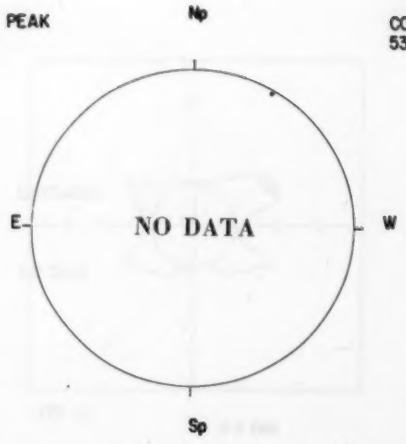


0415 UT

1-8Å FLUX (10^{-8} Wm^{-2})

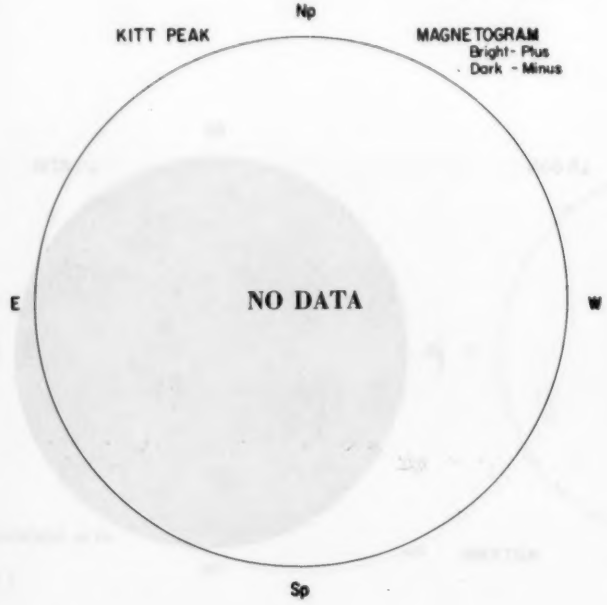
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

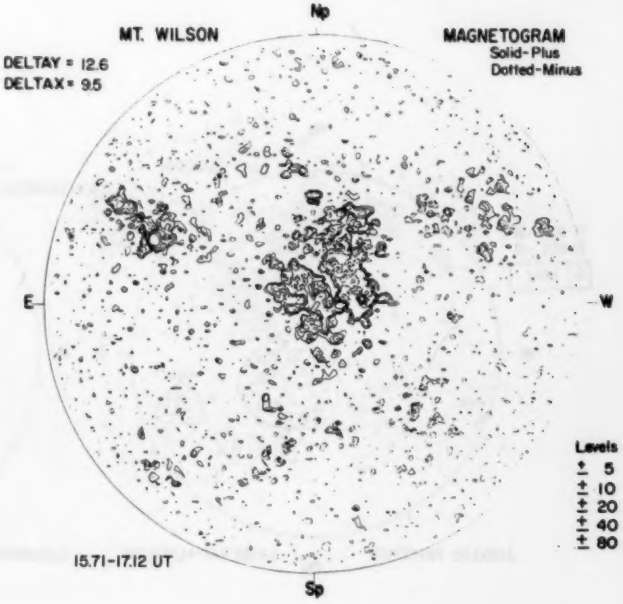
MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON

MAGNETOGRAM
Solid - Plus
Dotted - Minus

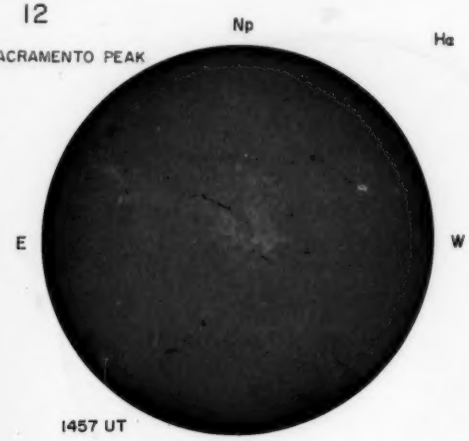
DELTAY = 12.6
DELTAX = 9.5



15.71-17.12 UT

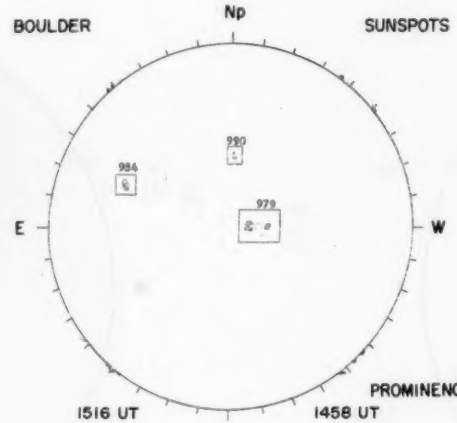
12

SACRAMENTO PEAK Hα



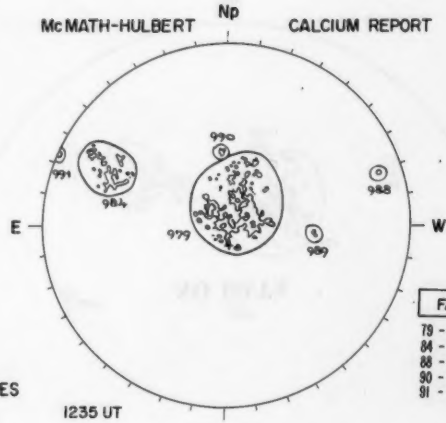
1457 UT

BOULDER SUNSPOTS



1516 UT 1458 UT

McMATH-HULBERT CALCIUM REPORT

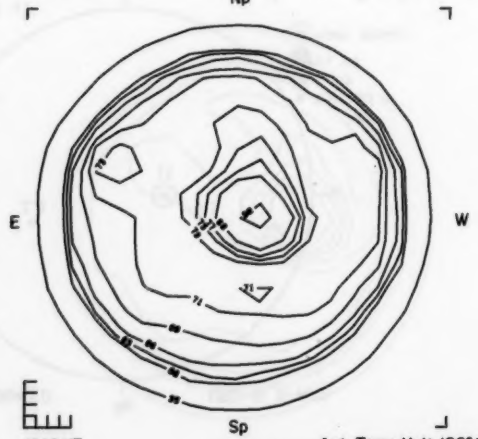


1235 UT

PROMINENCES

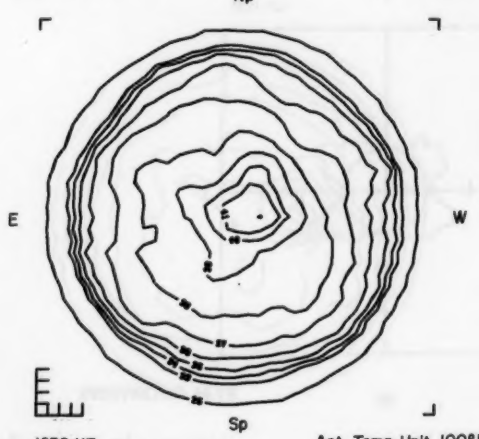
FAIR	S
79 - 7500-35	
84 - 2500-30	
88 - 0300-25	
90 - 0200-35	
91 - 0500-30	

NOSC LA POSTA 2.0 CM



1748 UT Ant. Temp. Unit 100°K

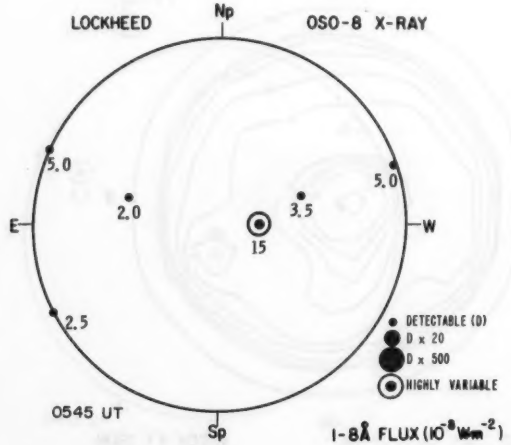
NOSC LA POSTA 8.6 MM



1638 UT Ant. Temp. Unit 100°K

OCTOBER 13, 1977 (P = 26.30, B_0 = 6.00, L_0 = 194.80)

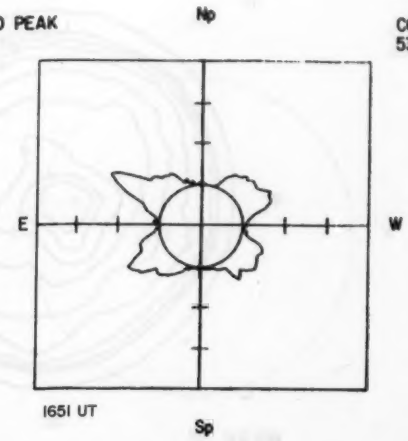
LOCKHEED OSO-8 X-RAY



0545 UT

1-8Å FLUX (10^{-8} Wm^{-2})

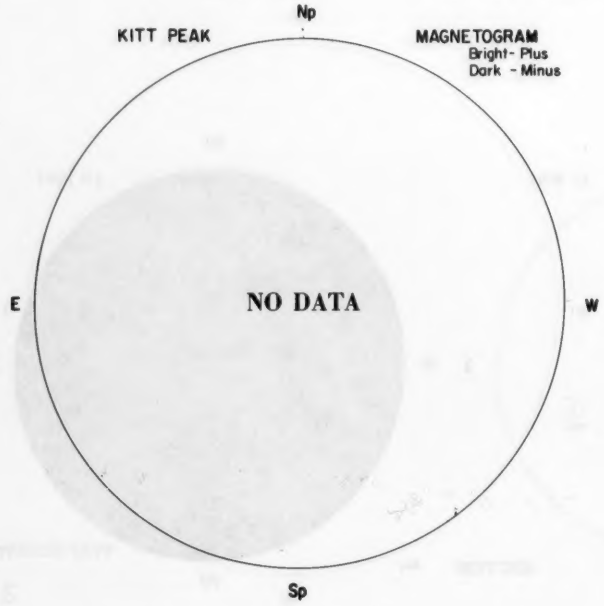
SACRAMENTO PEAK



CORONA (1.15 $R_\odot$)
5303 Å

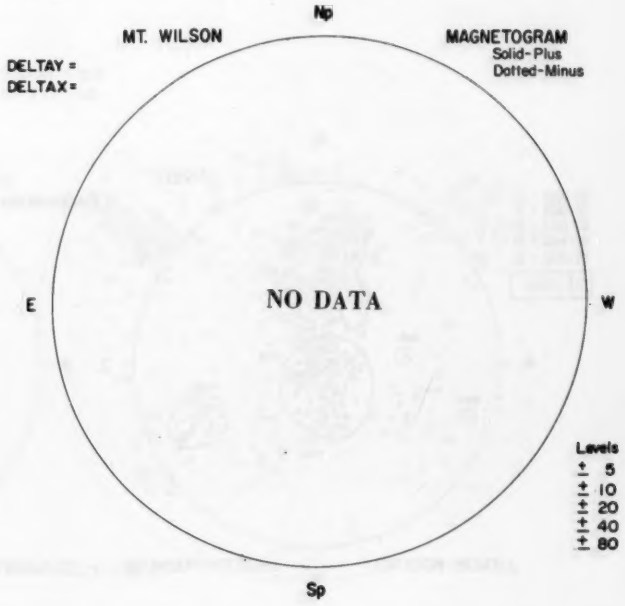
1651 UT

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



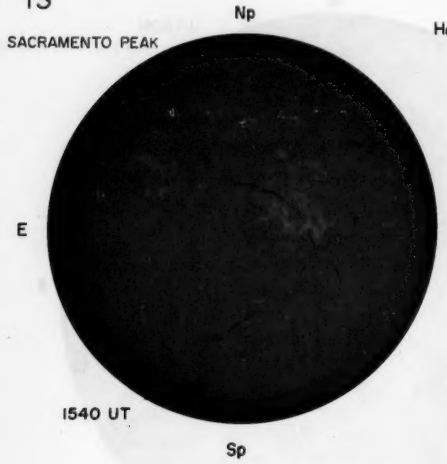
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =



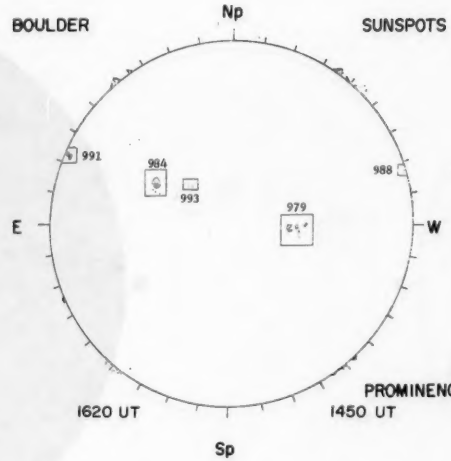
13

SACRAMENTO PEAK



1540 UT

Hα BOULDER



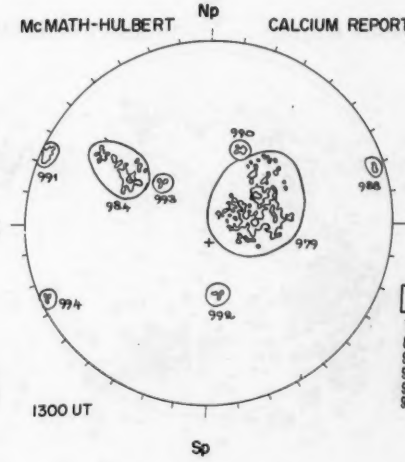
1620 UT

SUNSPOTS

PROMINENCES

1450 UT

McMATH-HULBERT

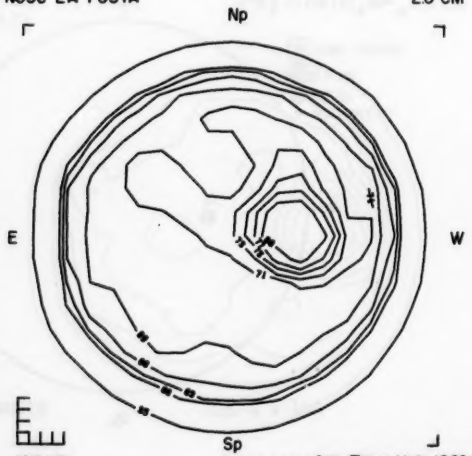


1300 UT

CALCIUM REPORT

FAIR	S
79 - 7500 - 35	
84 - 2500 - 30	
90 - 0400 - 30	
91 - 1500 - 35	
92 - 0200 - 25	
93 - 0300 - 25	

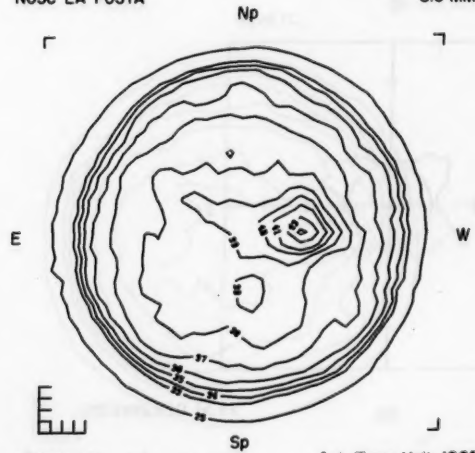
NOSC LA POSTA 2.0 CM



1812 UT

Ant. Temp. Unit 100°K

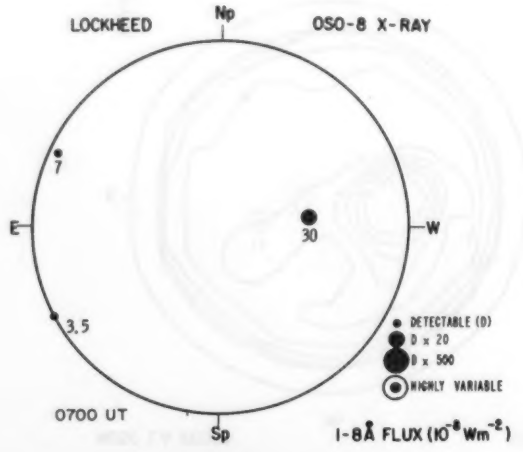
NOSC LA POSTA 8.6 MM

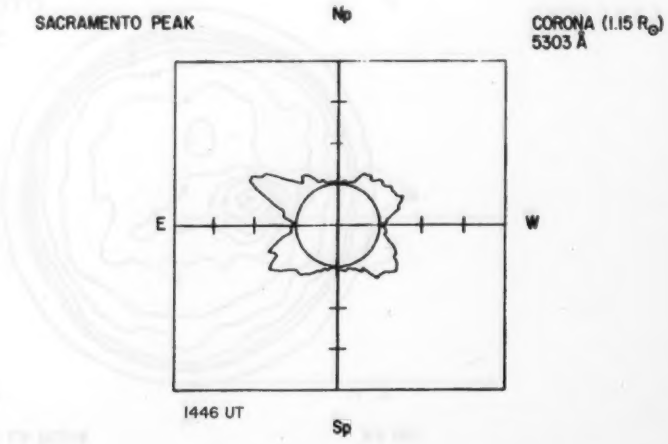


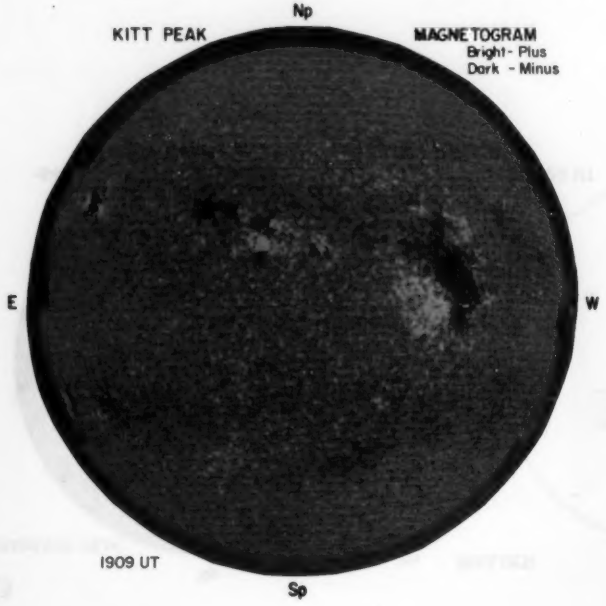
1658 UT

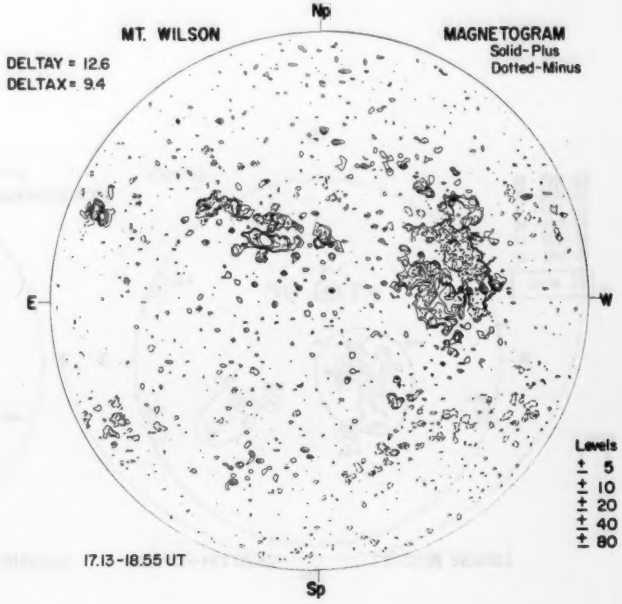
Ant. Temp. Unit 100°K

OCTOBER 14, 1977 (P = 26.28, B_0 = 5.93, L_0 = 181.60)

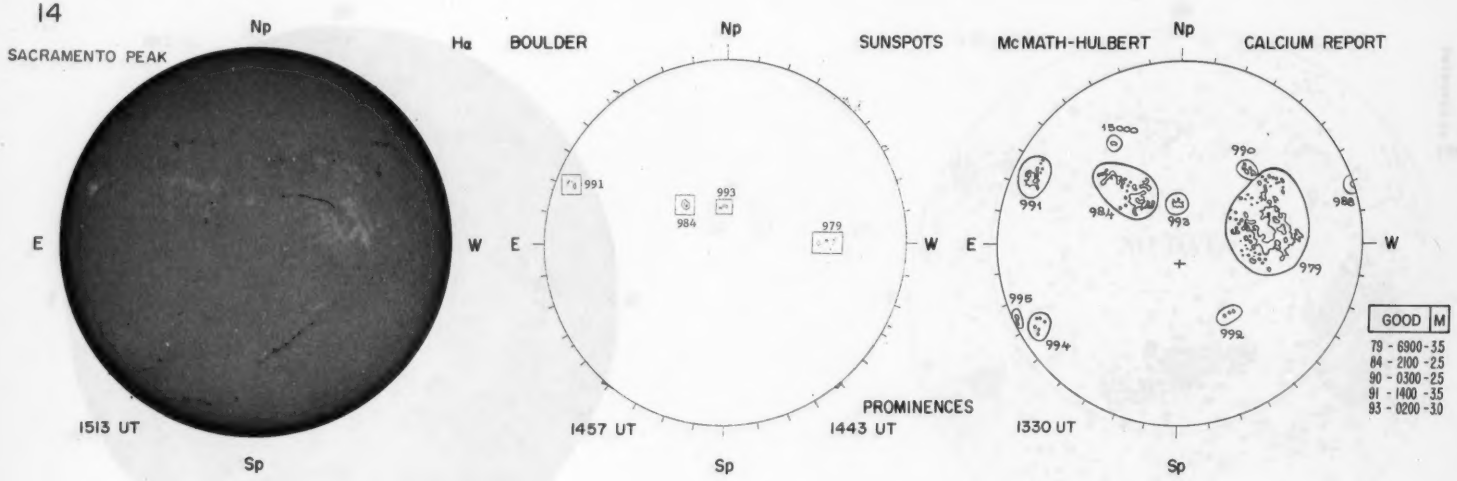


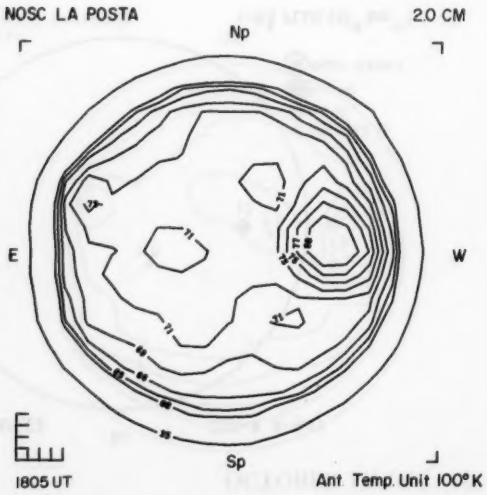


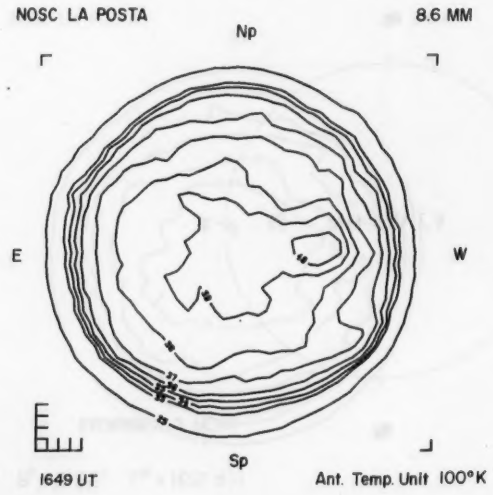




14

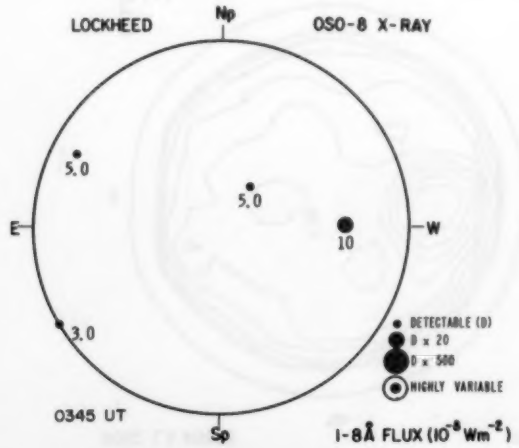

SACRAMENTO PEAK
Np
E
W
Sp
1513 UT
Hα
BOULDER
Np
E
W
Sp
1457 UT
991
993
984
979
SUNSPOTS
PROMINENCES
1443 UT
McMATH-HULBERT
Np
E
W
Sp
1330 UT
15000
990
991
984
992
988
979
995
994
992
CALCIUM REPORT
GOOD | M
79 - 6900 - 3.5
84 - 2100 - 2.5
90 - 0300 - 2.5
91 - 1400 - 3.5
93 - 0200 - 3.0


NOSC LA POSTA
2.0 CM
Np
E
W
Sp
1805 UT
Ant. Temp. Unit 100°K


NOSC LA POSTA
8.6 MM
Np
E
W
Sp
1649 UT
Ant. Temp. Unit 100°K

OCTOBER 15, 1977 (P = 26.25, B_o = 5.85, L_o = 168.41)

LOCKHEED OSO-8 X-RAY

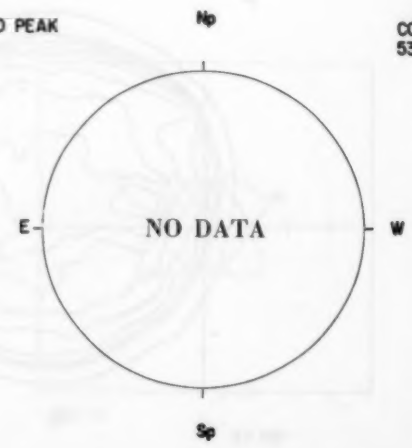


0345 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

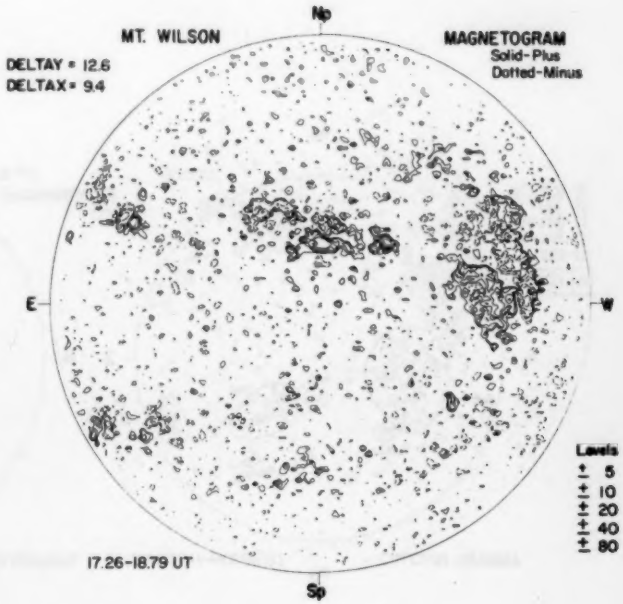
MAGNETOGRAM
Bright - Plus
Dark - Minus

1917 UT

MT. WILSON

DELTAY = 12.6
DELTAX = 9.4

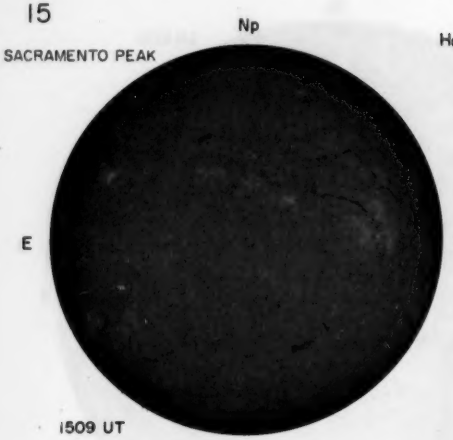
MAGNETOGRAM
Solid - Plus
Dotted - Minus



17.26-18.79 UT

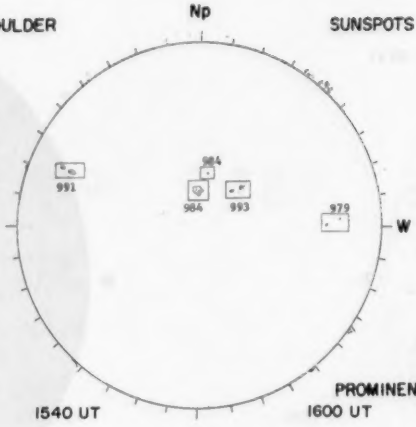
15

SACRAMENTO PEAK



1509 UT

Hα BOULDER



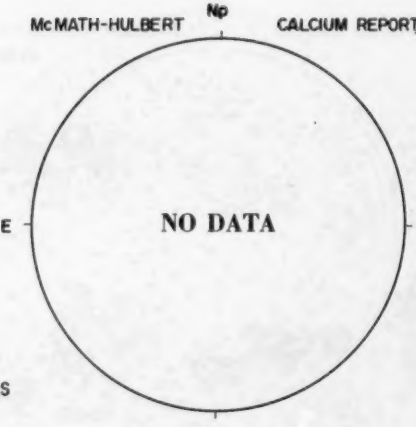
1540 UT

SUNSPOTS

PROMINENCES

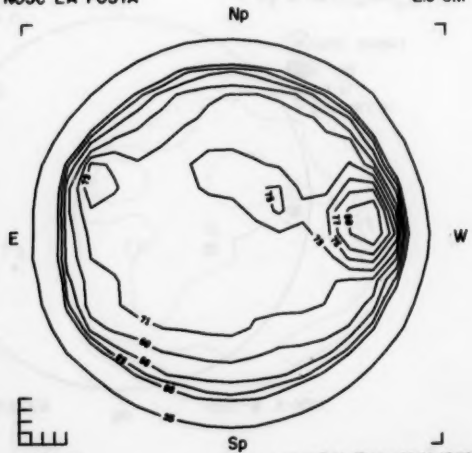
1600 UT

McMATH-HULBERT



CALCIUM REPORT

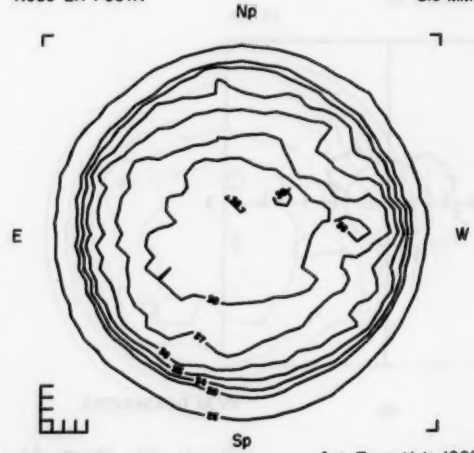
NOSC LA POSTA 2.0 CM



1820 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM



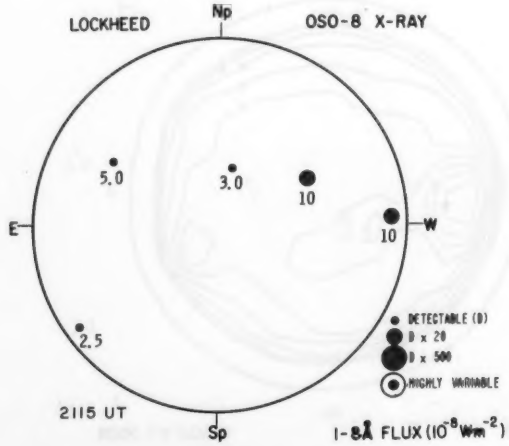
1720 UT

Ant. Temp. Unit 100°K

59
Oct 77

OCTOBER 16, 1977 (P = 26.21, B_0 = 5.78, L_0 = 155.22)

LOCKHEED OSO-8 X-RAY

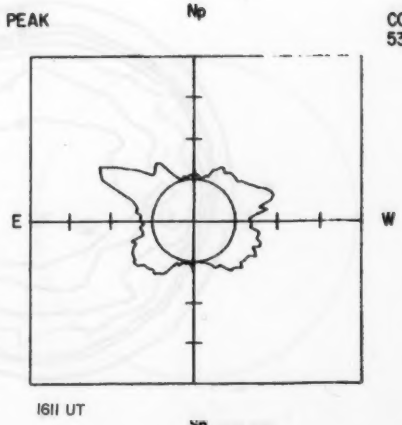


2115 UT

1-8Å FLUX (10^{-8} Wm^{-2})

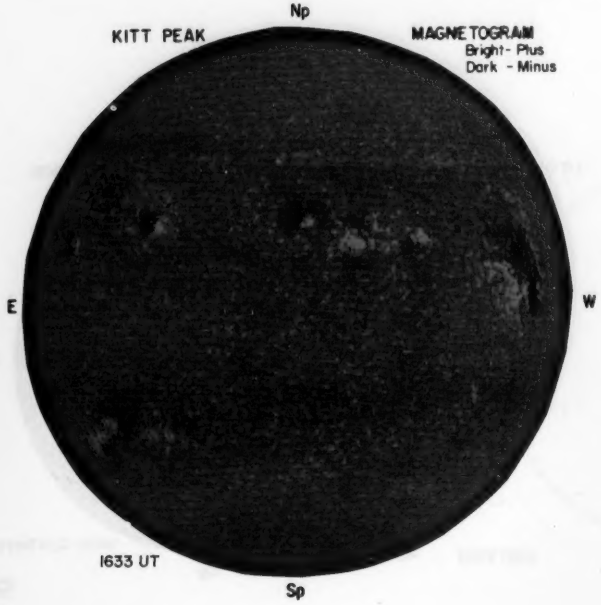
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



1611 UT

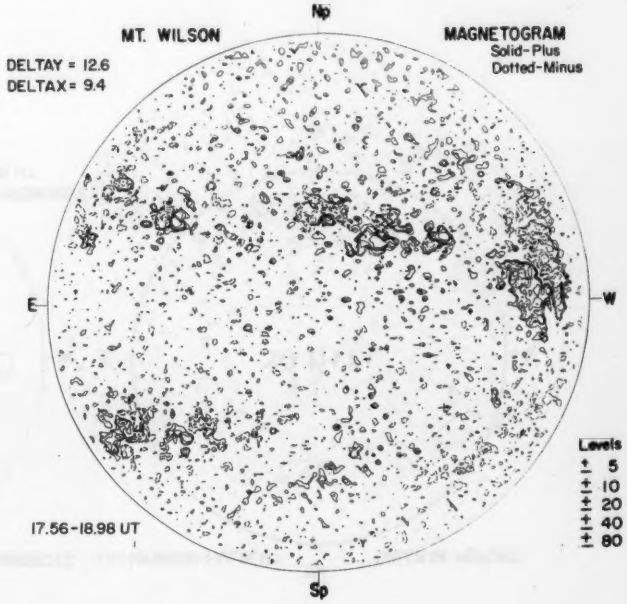
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1633 UT

MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

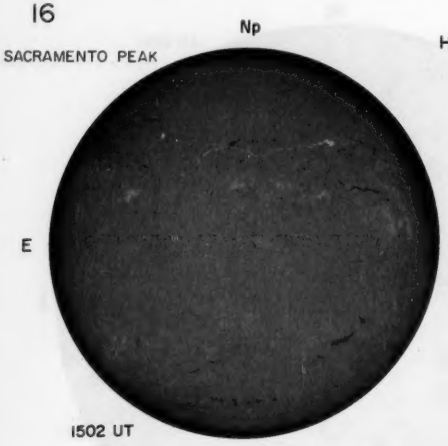
DELTAY = 12.6
DELTAX = 9.4



17.56-18.98 UT

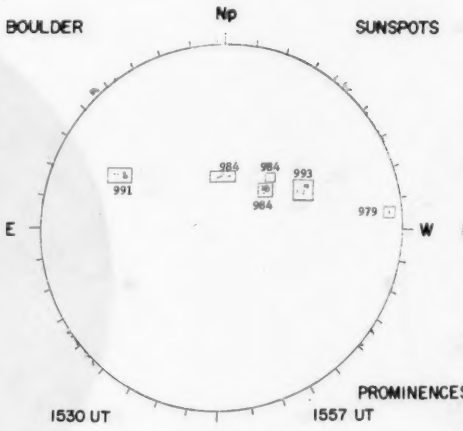
16

SACRAMENTO PEAK



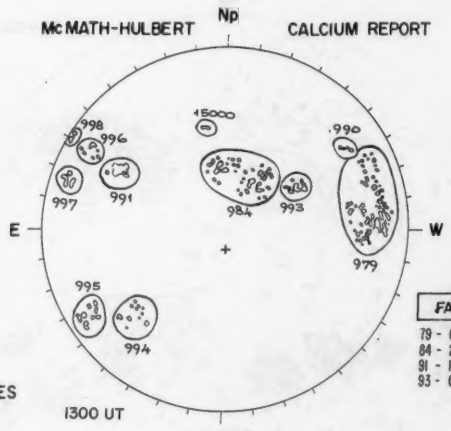
1502 UT

Hα BOULDER



1530 UT

SUNSPOTS



1557 UT

McMATH-HULBERT

1300 UT

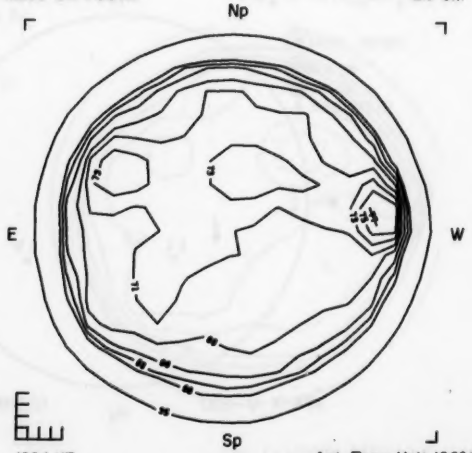
CALCIUM REPORT

PROMINENCES

FAIR	D

79 - 6000-3.0
84 - 2200-2.5
91 - 1200-3.5
93 - 0800-3.0

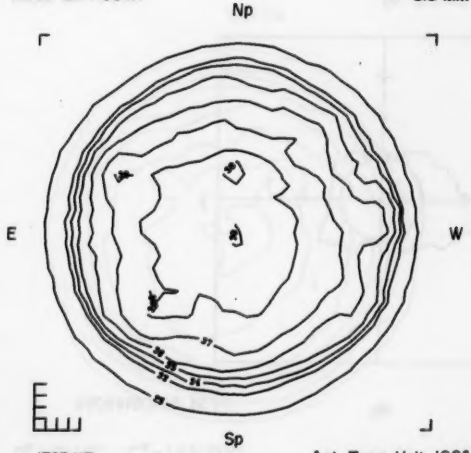
NOSC LA POSTA 2.0 CM



1804 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM



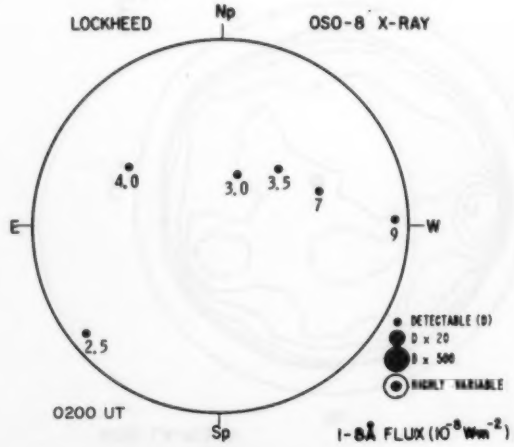
1703 UT

Ant. Temp. Unit 100°K

61
Oct 77

OCTOBER 17, 1977 (P = 26.17, B_0 = 5.70, L_0 = 142.03)

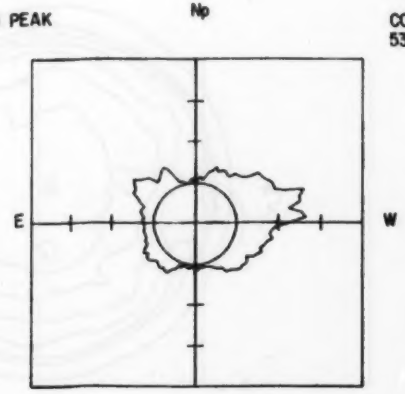
LOCKHEED OSO-8 X-RAY



0200 UT

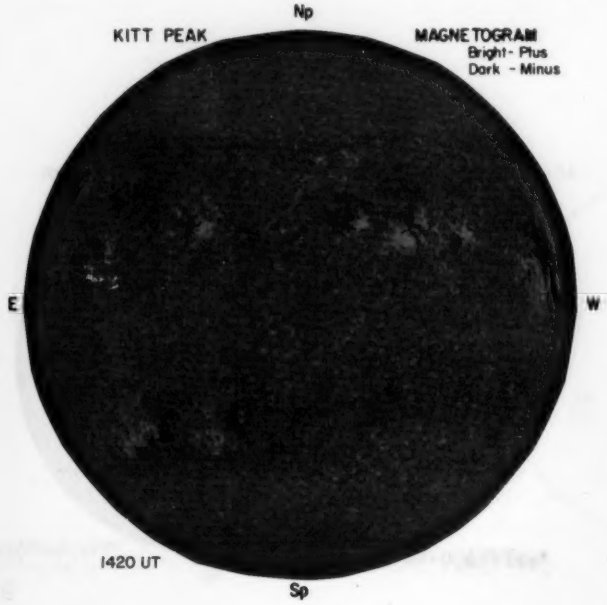
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



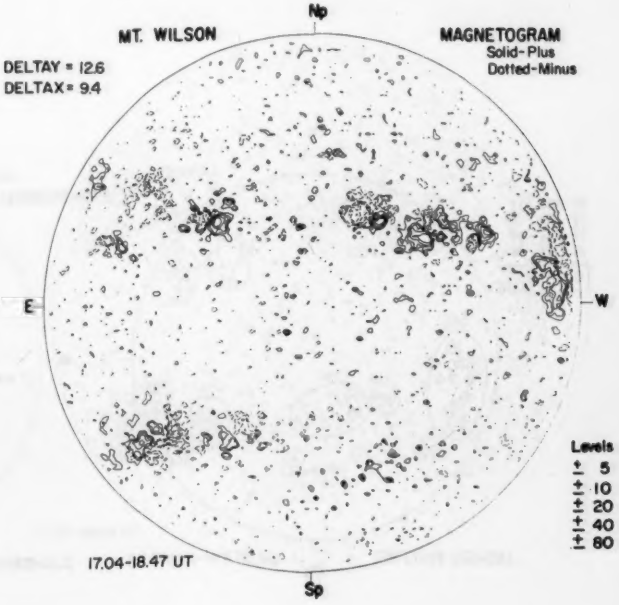
1525 UT

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



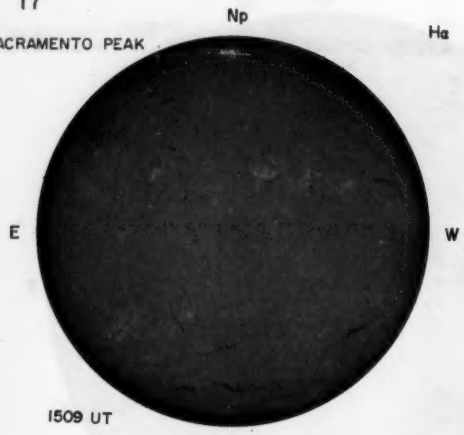
1420 UT

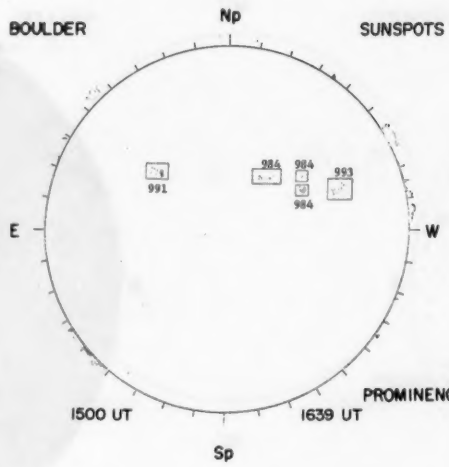
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.6
DELTAX = 9.4

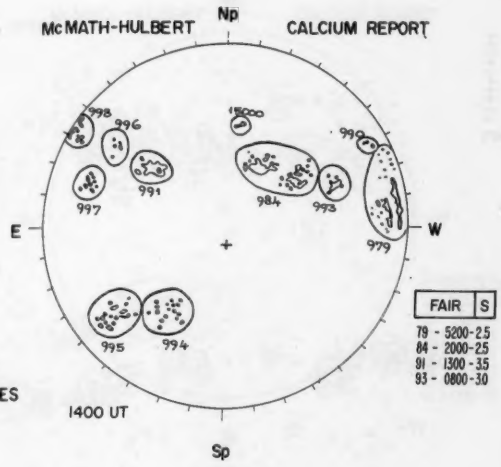


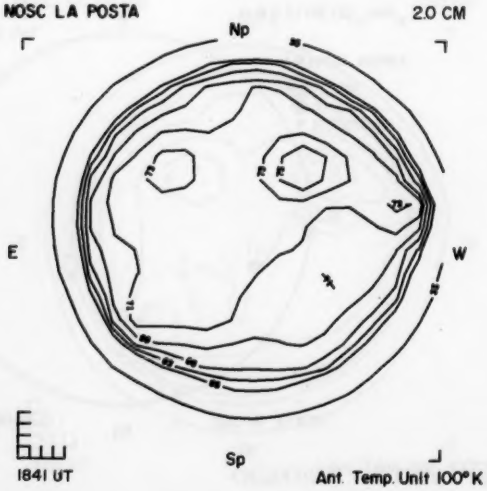
17.04-18.47 UT

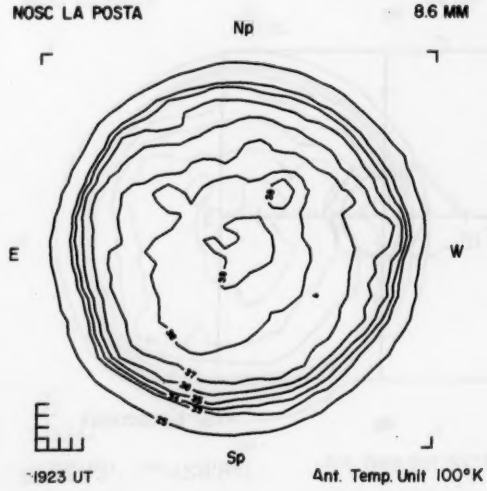
17


Np
SACRAMENTO PEAK
Hα
E
W
1509 UT
Sp


Np
BOULDER
SUNSPOTS
991
984
984
984
993
E
W
1500 UT
1639 UT
Sp
PROMINENCES

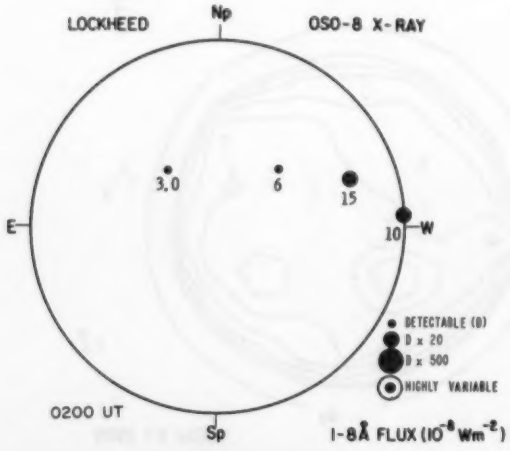

Np
McMATH-HULBERT
CALCIUM REPORT
998
996
15000
999
997
991
984
993
979
995
994
E
W
Sp
1400 UT
FAIR S
79 - 5200-2.5
84 - 2000-2.5
91 - 1300-3.5
93 - 0800-3.0

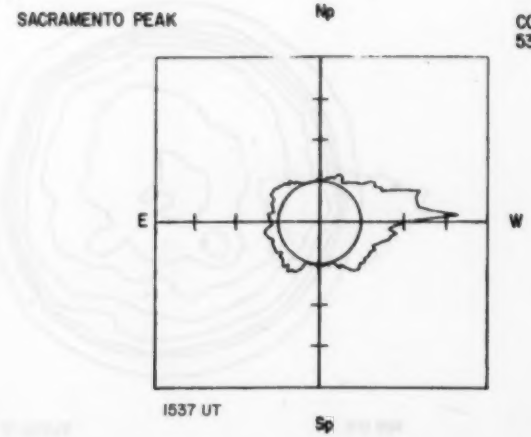

NOSC LA POSTA
2.0 CM
Np
E
W
Sp
1841 UT
Ant. Temp. Unit 100°K

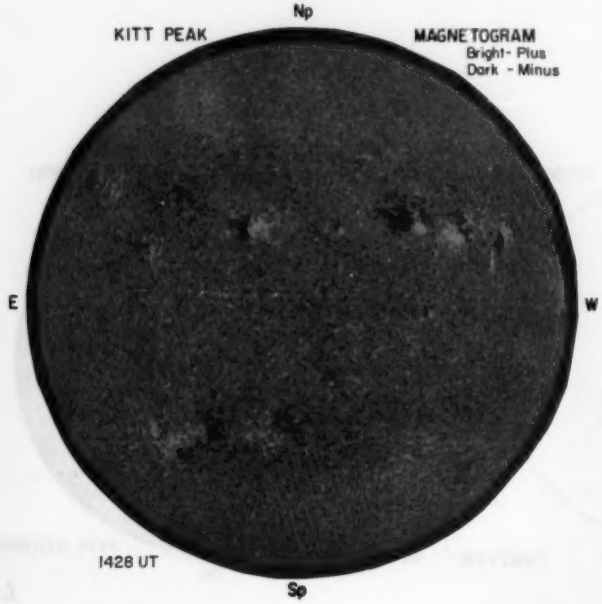

NOSC LA POSTA
8.6 MM
Np
E
W
Sp
1923 UT
Ant. Temp. Unit 100°K

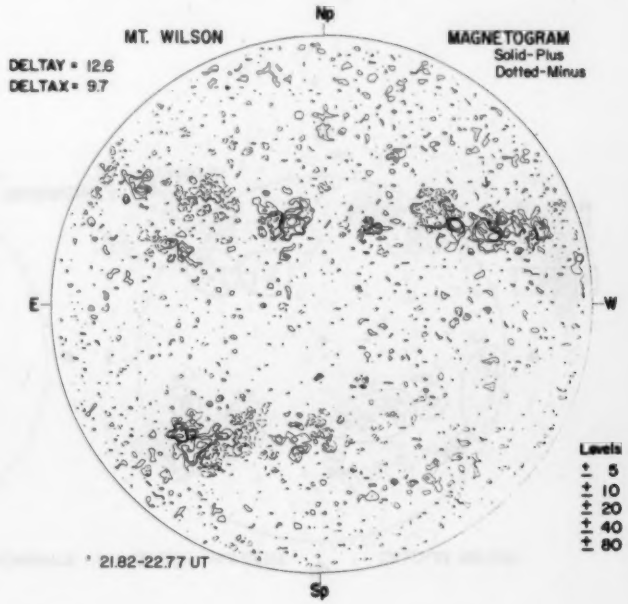
63
Oct 77

OCTOBER 18, 1977 (P = 26.11, B_o = 5.62, L_o = 128.84)

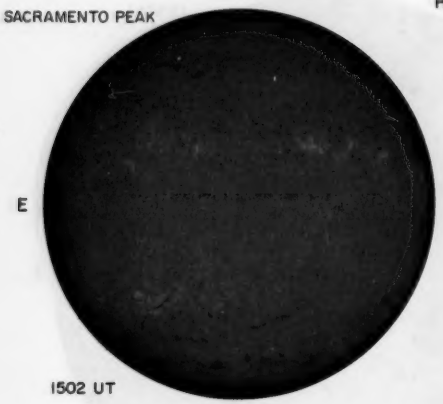






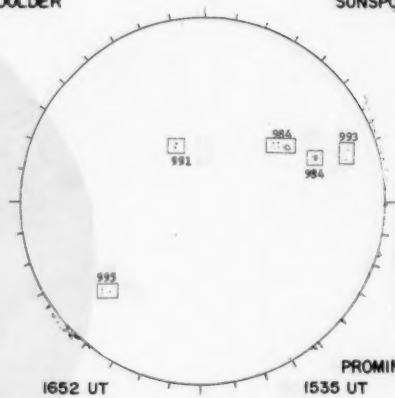


SACRAMENTO PEAK



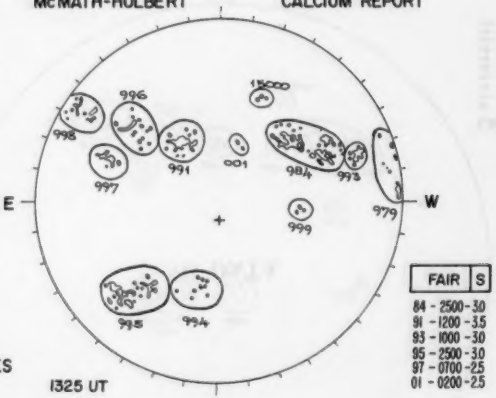
1502 UT

Hα BOULDER



1652 UT

SUNSPOTS



McMATH-HULBERT

1325 UT

CALCIUM REPORT

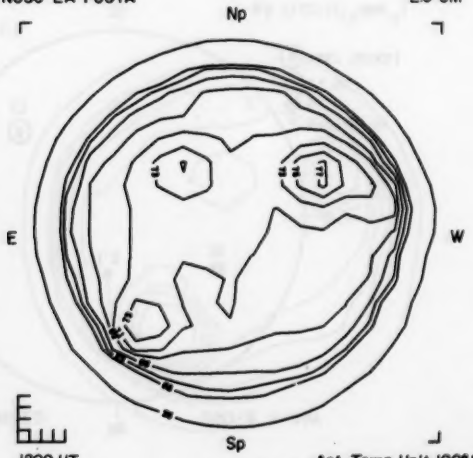
FAIR	S

84 - 2500 - 30
91 - 1200 - 35
93 - 1000 - 30
95 - 2500 - 30
97 - 0700 - 25
01 - 0200 - 25

PROMINENCES

1535 UT

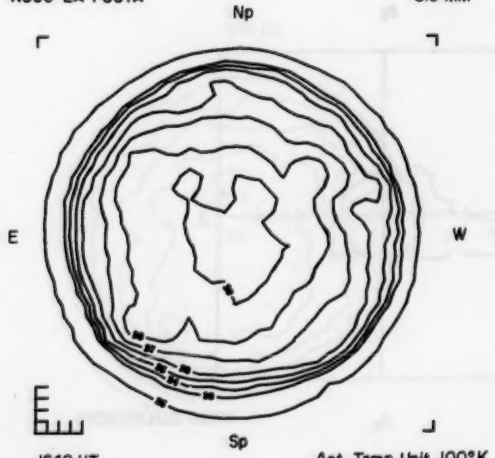
NOSC LA POSTA 2.0 CM



1809 UT

Ant. Temp. Unit 100°K

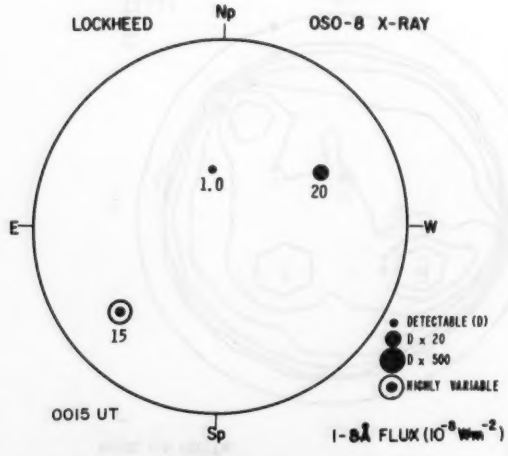
NOSC LA POSTA 8.6 MM



1640 UT

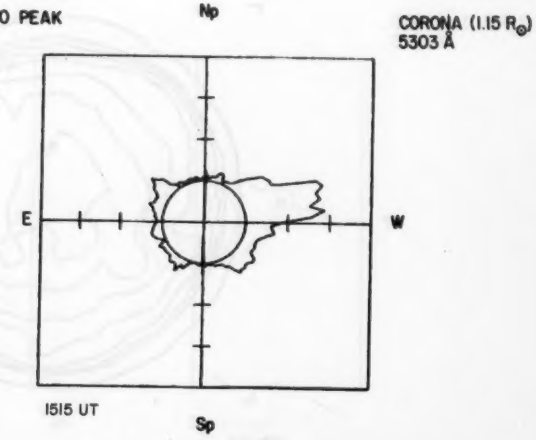
Ant. Temp. Unit 100°K

LOCKHEED OSO-8 X-RAY

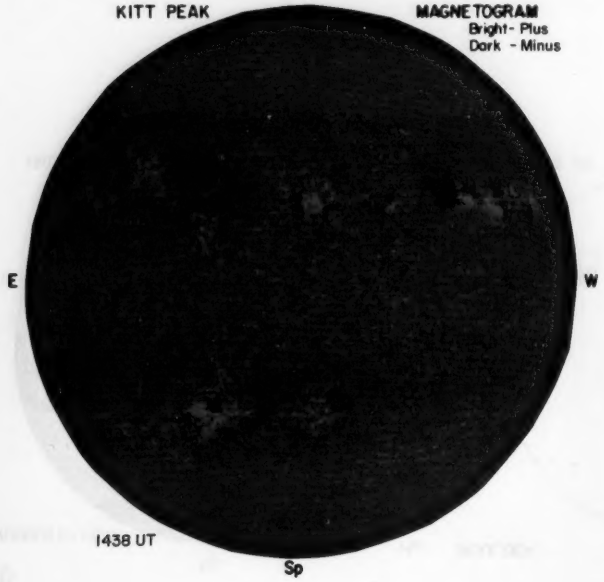


1-8Å FLUX (10^{-8} Wm^{-2})

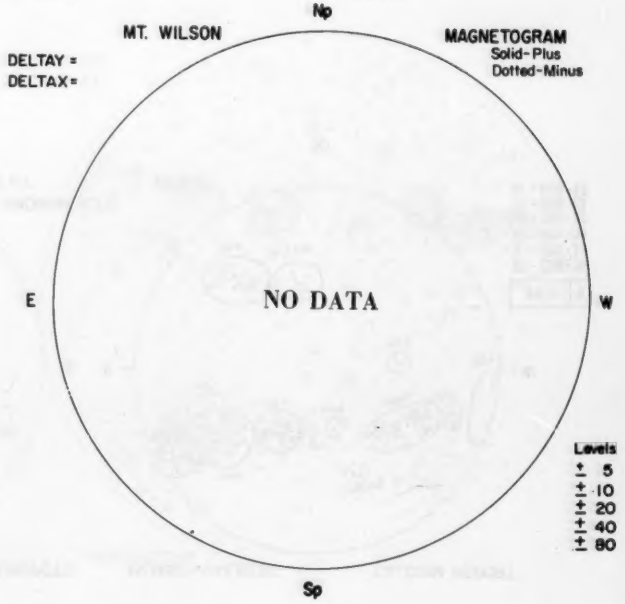
SACRAMENTO PEAK



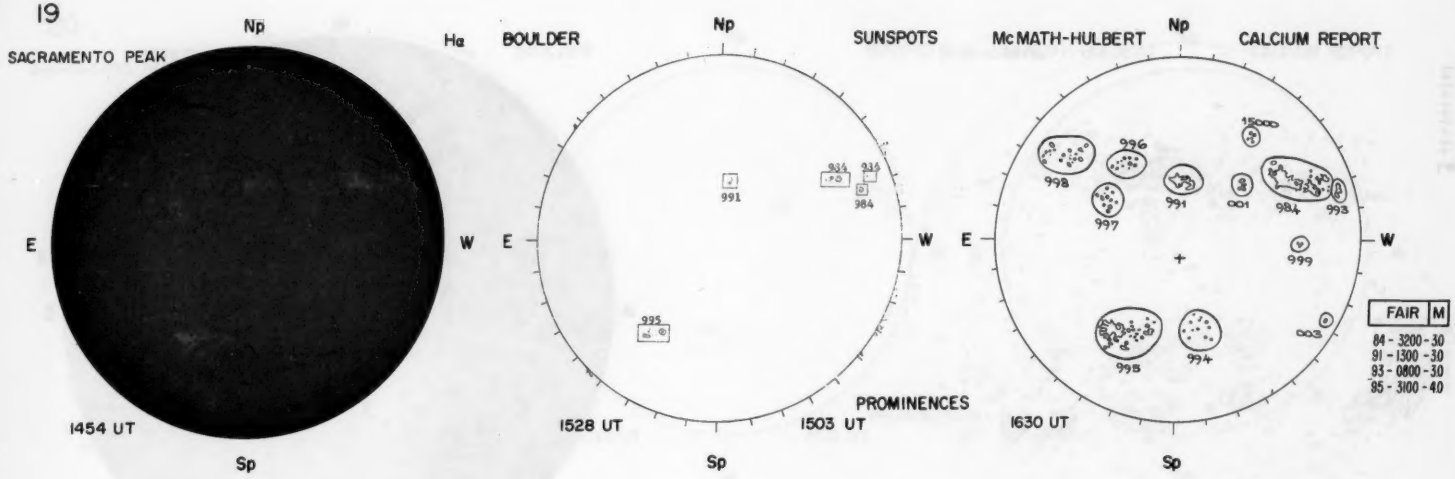
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

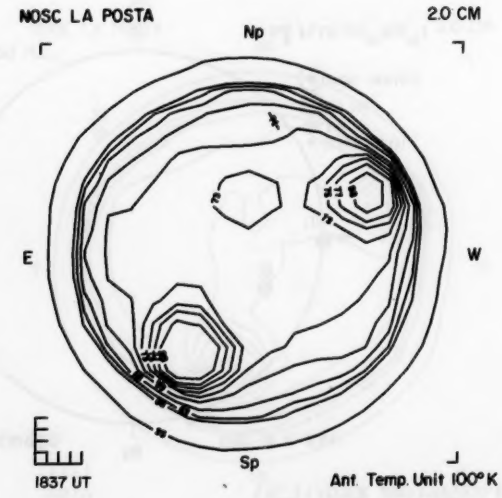


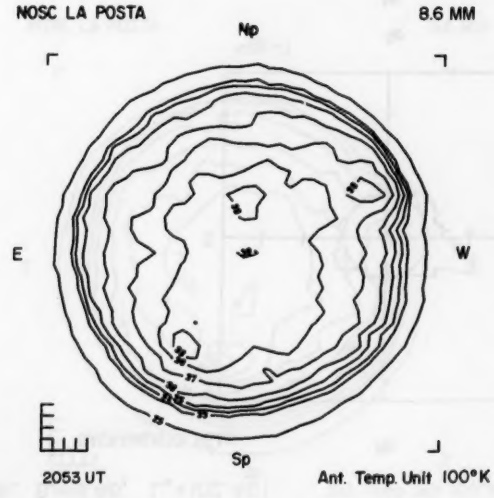
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY =
DELTAX =



19

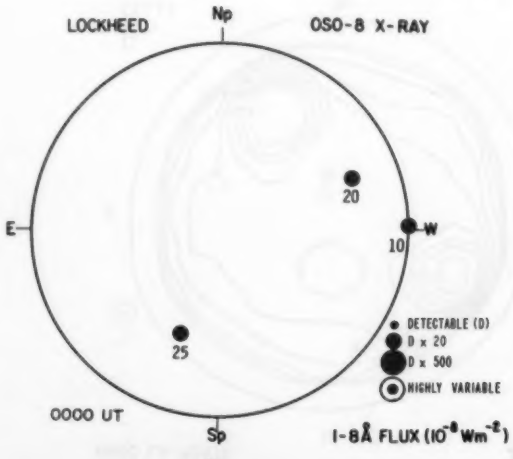

SACRAMENTO PEAK
Np
Hα
E
W
1454 UT
Sp
BOULDER
Np
SUNSPOTS
991
934
935
984
995
E
W
1528 UT
1503 UT
Sp
PROMINENCES
McMATH-HULBERT
Np
CALCIUM REPORT
15000
996
998
997
991
001
984
993
999
995
994
003
E
W
1630 UT
Sp
FAIR M
84 - 3200 - 30
91 - 1300 - 30
93 - 0800 - 30
95 - 3100 - 40


NOSC LA POSTA
2.0 CM
Np
E
W
Sp
1837 UT
Ant. Temp. Unit 100°K

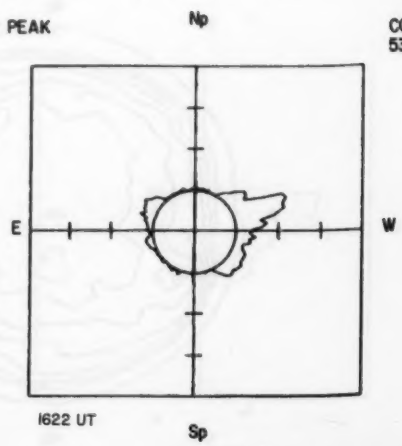

NOSC LA POSTA
8.6 MM
Np
E
W
Sp
2053 UT
Ant. Temp. Unit 100°K

OCTOBER 20, 1977 (P = 25.98, B_o = 5.46, L_o = 102.46)

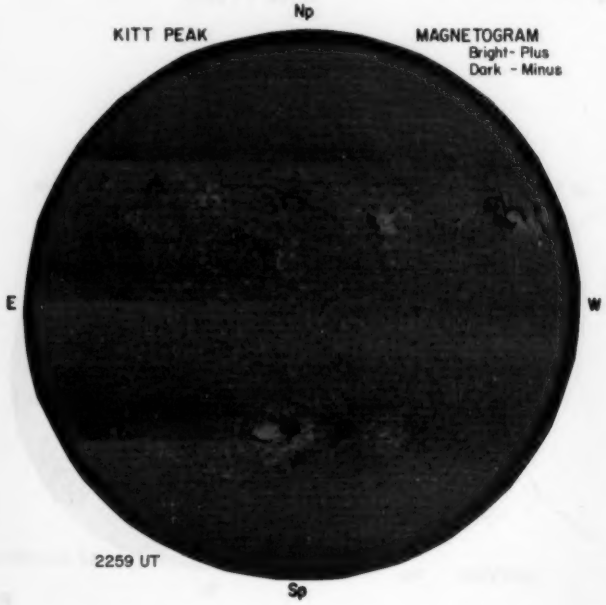
LOCKHEED OSO-8 X-RAY



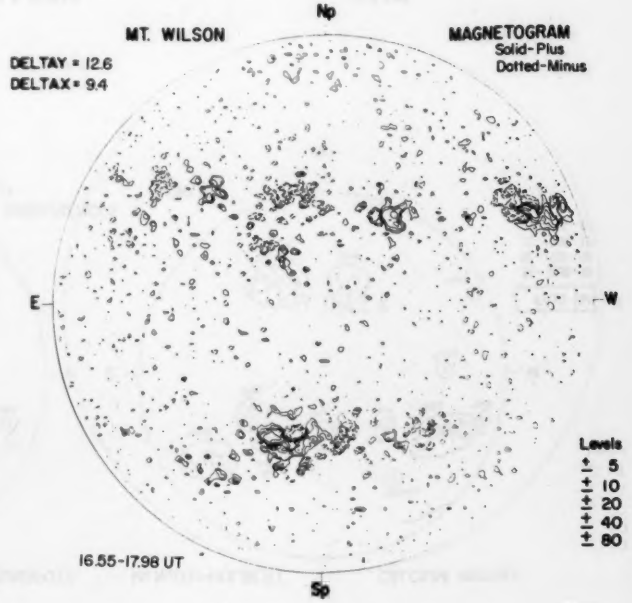
SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



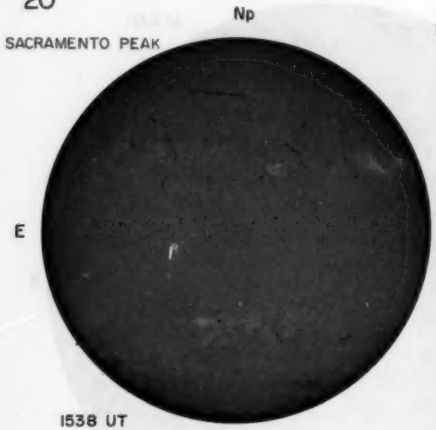
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.6
DELTAX = 9.4

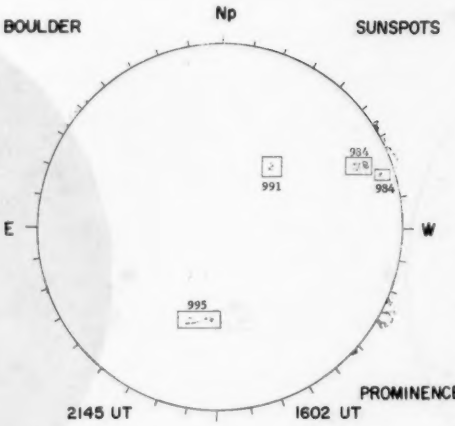


SACRAMENTO PEAK Hα



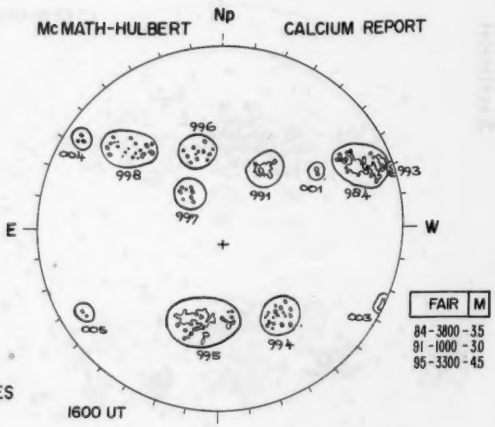
1538 UT

BOULDER SUNSPOTS



2145 UT 1602 UT

McMATH-HULBERT CALCIUM REPORT

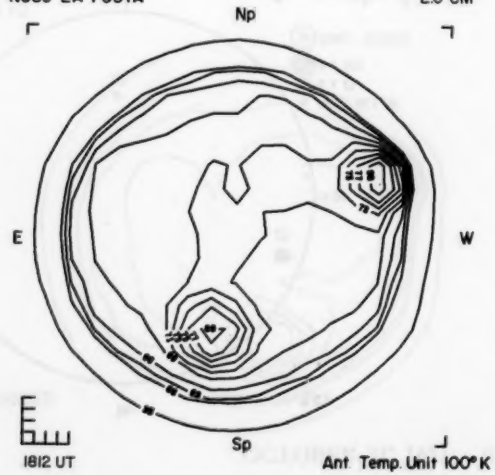


1600 UT

PROMINENCES

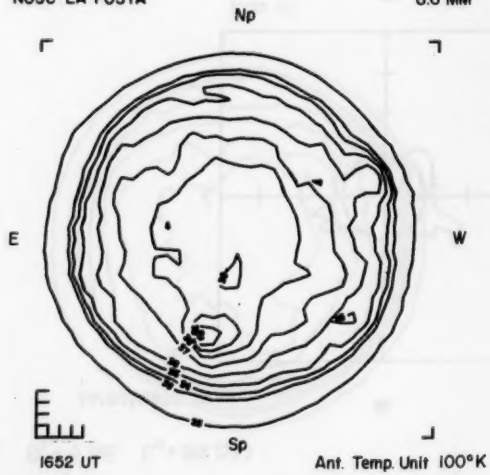
FAIR	M
84 - 3800 - 35	
91 - 1000 - 30	
95 - 3300 - 45	

NOSC LA POSTA 2.0 CM



1812 UT Ant. Temp. Unit 100°K

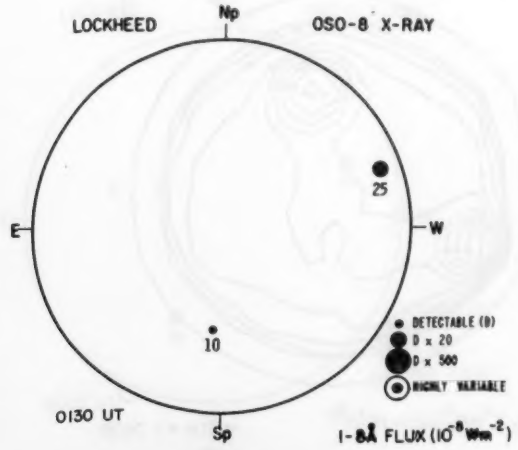
NOSC LA POSTA 8.6 MM



1652 UT Ant. Temp. Unit 100°K

OCTOBER 21, 1977 (P = 25.91, B_o = 5.38, L_o = 89.27)

LOCKHEED OSO-8 X-RAY

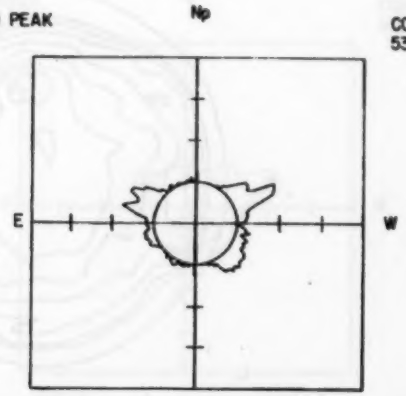


0130 UT

1-8Å FLUX (10^{-6} Wm^{-2})

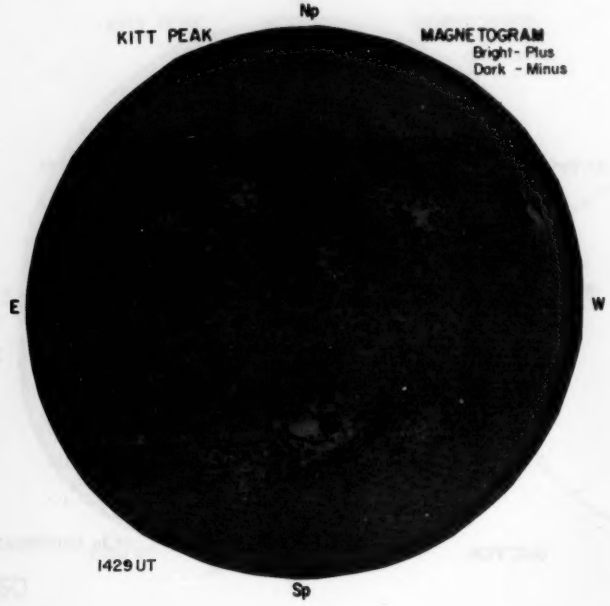
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



2232 UT

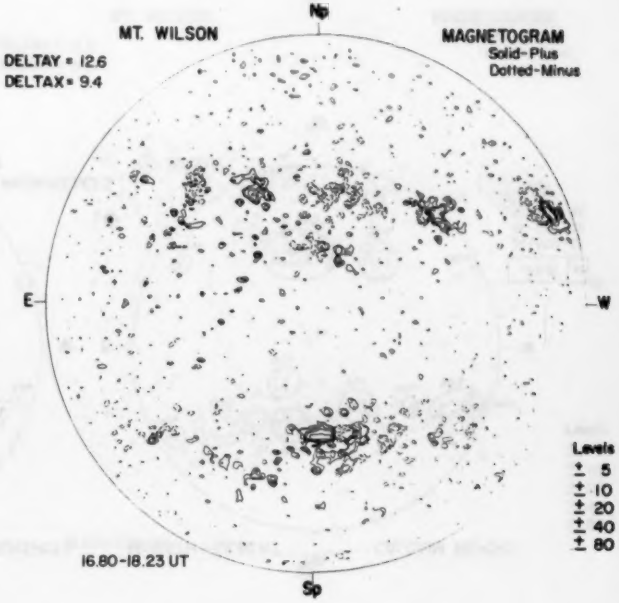
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1429 UT

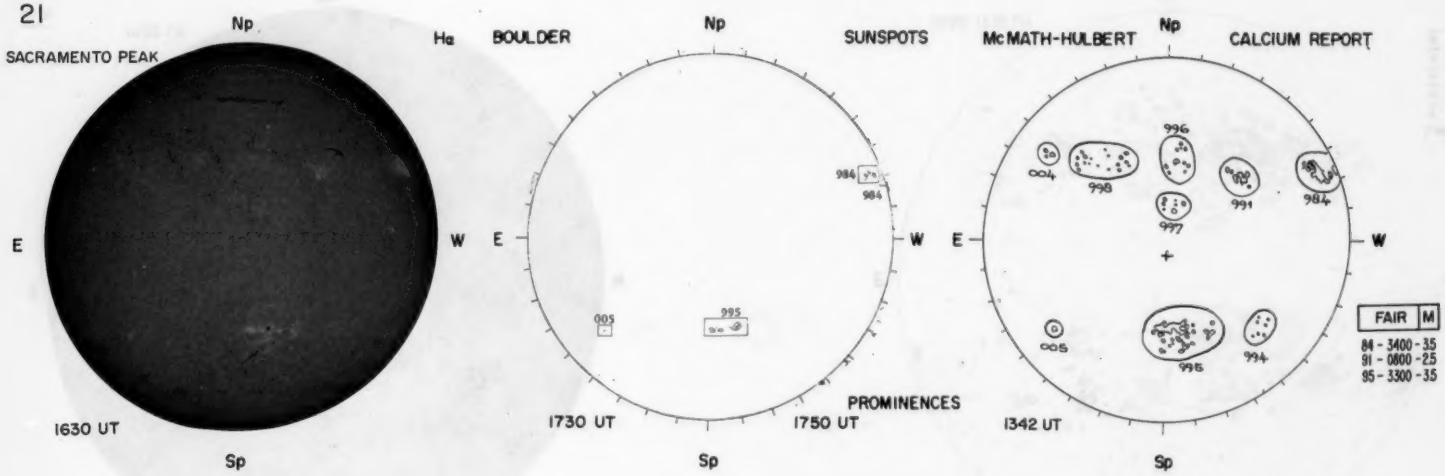
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

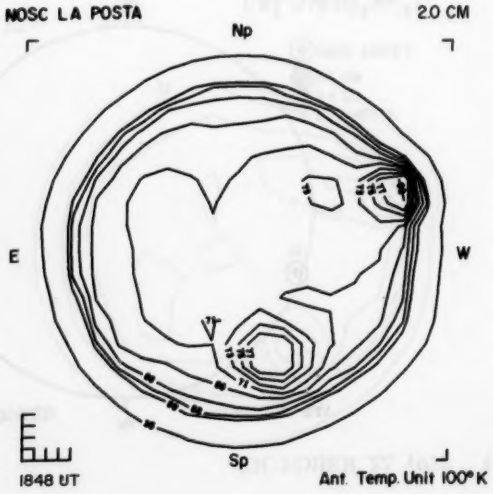
DELTAY = 12.6
DELTAX = 9.4

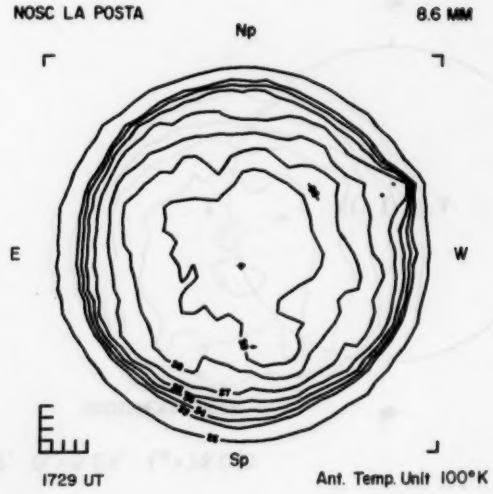


16.80-18.23 UT

21

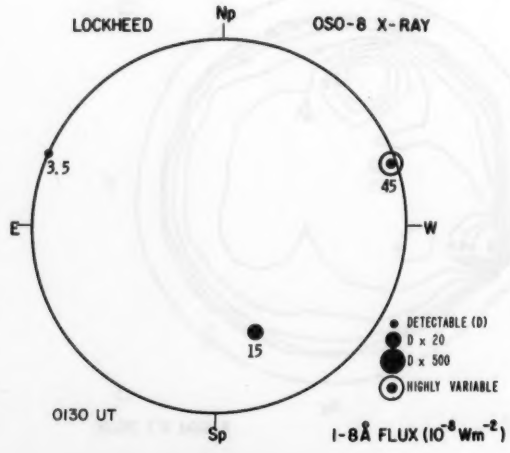

SACRAMENTO PEAK
Np
Hα
E
W
1630 UT
Sp
BOULDER
SUNSPOTS
Np
E
W
005
995
984
984
1730 UT
1750 UT
Sp
PROMINENCES
McMATH-HULBERT
CALCIUM REPORT
Np
E
W
004
998
996
997
991
984
005
995
994
1342 UT
Sp
FAIR M
84 - 3400 - 35
91 - 0800 - 25
95 - 3300 - 35

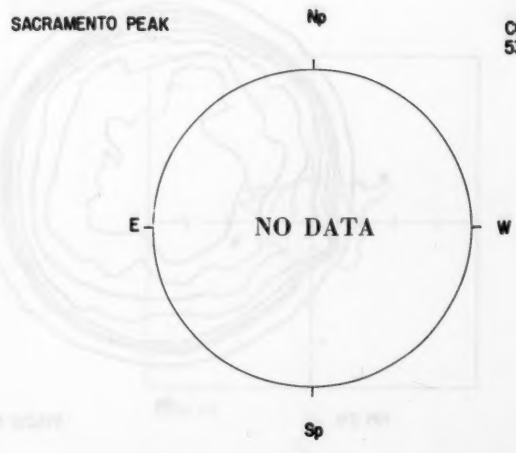

NOSC LA POSTA
2.0 CM
Np
E
W
Sp
1848 UT
Ant. Temp. Unit 100°K

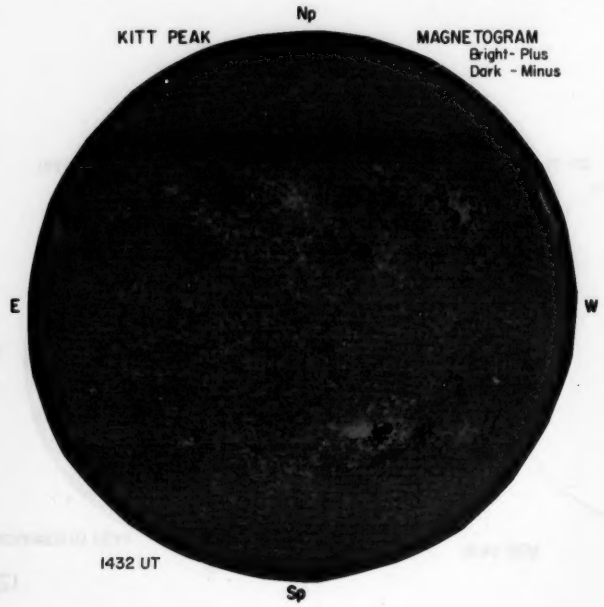

NOSC LA POSTA
8.6 MM
Np
E
W
Sp
1729 UT
Ant. Temp. Unit 100°K

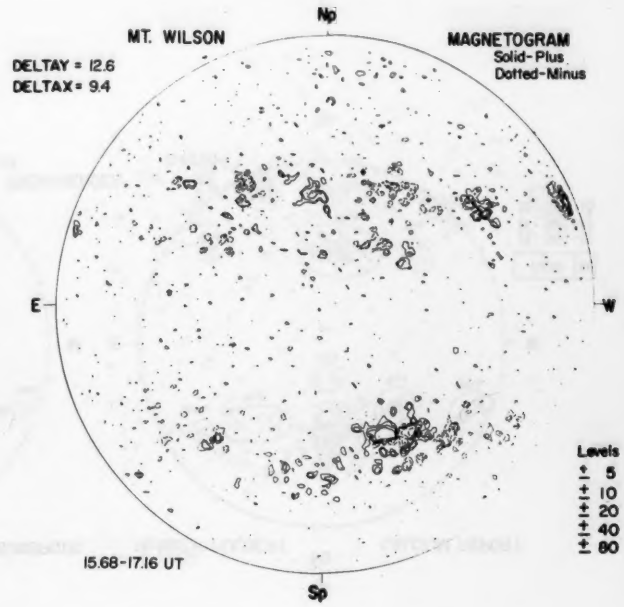
71
Oct 77

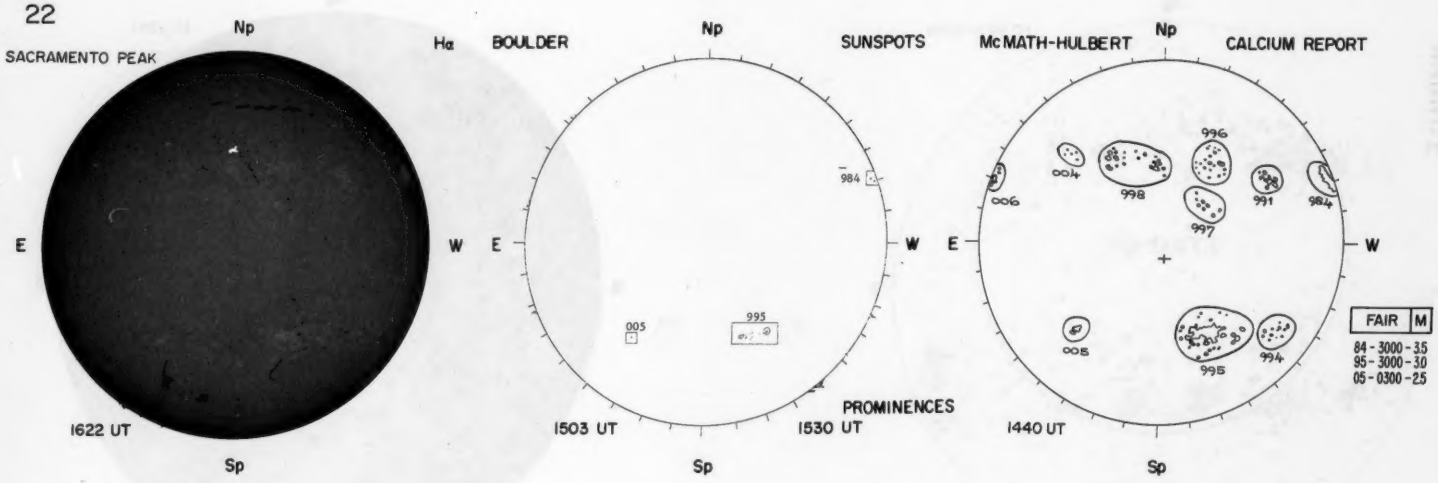
OCTOBER 22, 1977 (P = 25.82, B_o = 5.29, L_o = 76.09)

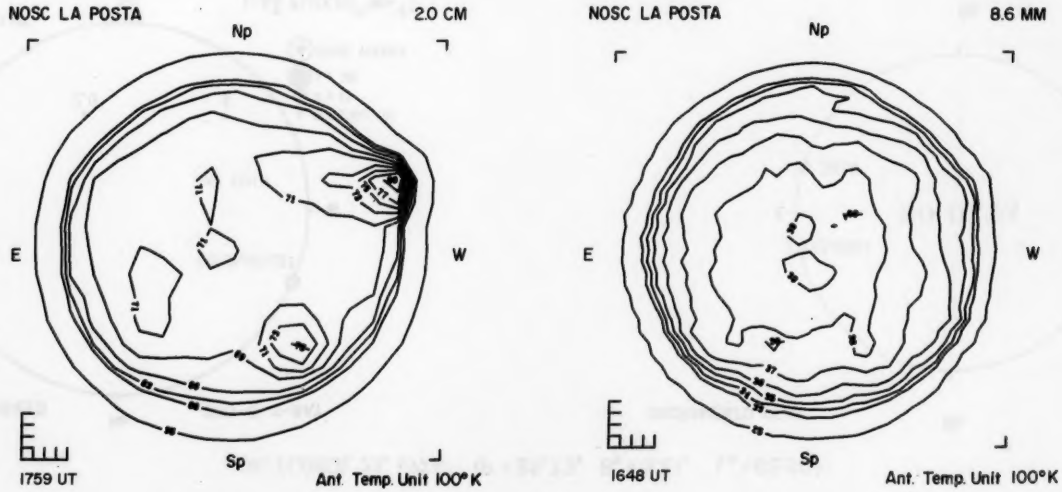






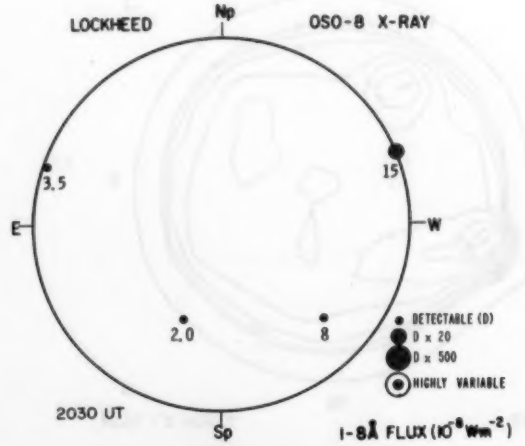



SACRAMENTO PEAK
Np
Hα
E
W
Sp
1622 UT
BOULDER
SUNSPOTS
984
005
995
PROMINENCES
1503 UT
1530 UT
McMATH-HULBERT
CALCIUM REPORT
996
004
998
006
997
991
984
005
995
994
1440 UT
FAIR M
84 - 3000 - 3.5
95 - 3000 - 3.0
05 - 0300 - 2.5


NOSC LA POSTA
2.0 CM
Np
E
W
Sp
1759 UT
Ant. Temp. Unit 100°K
NOSC LA POSTA
8.6 MM
Np
E
W
Sp
1648 UT
Ant. Temp. Unit 100°K

OCTOBER 23, 1977 (P = 25.73, B_o = 5.21, L_o = 62.90)

LOCKHEED OSO-8 X-RAY

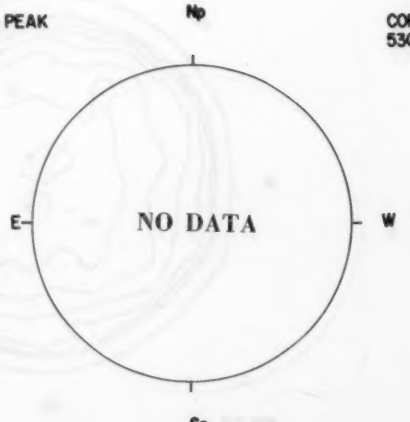


2030 UT

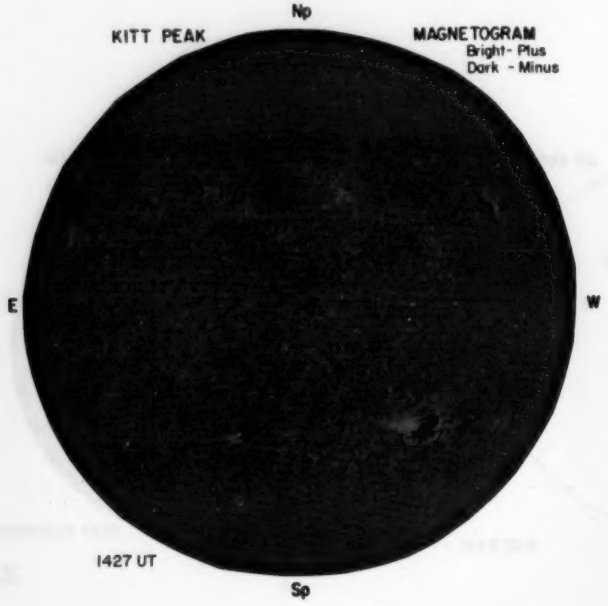
1-8Å FLUX (10^{-6} Wm^{-2})

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



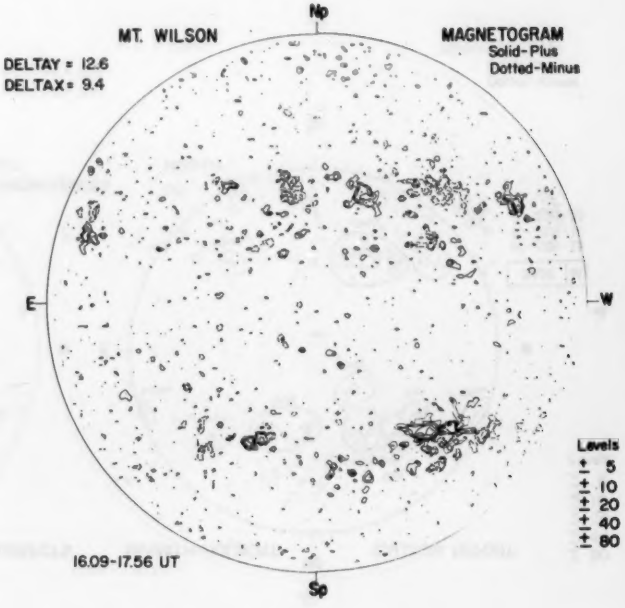
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1427 UT

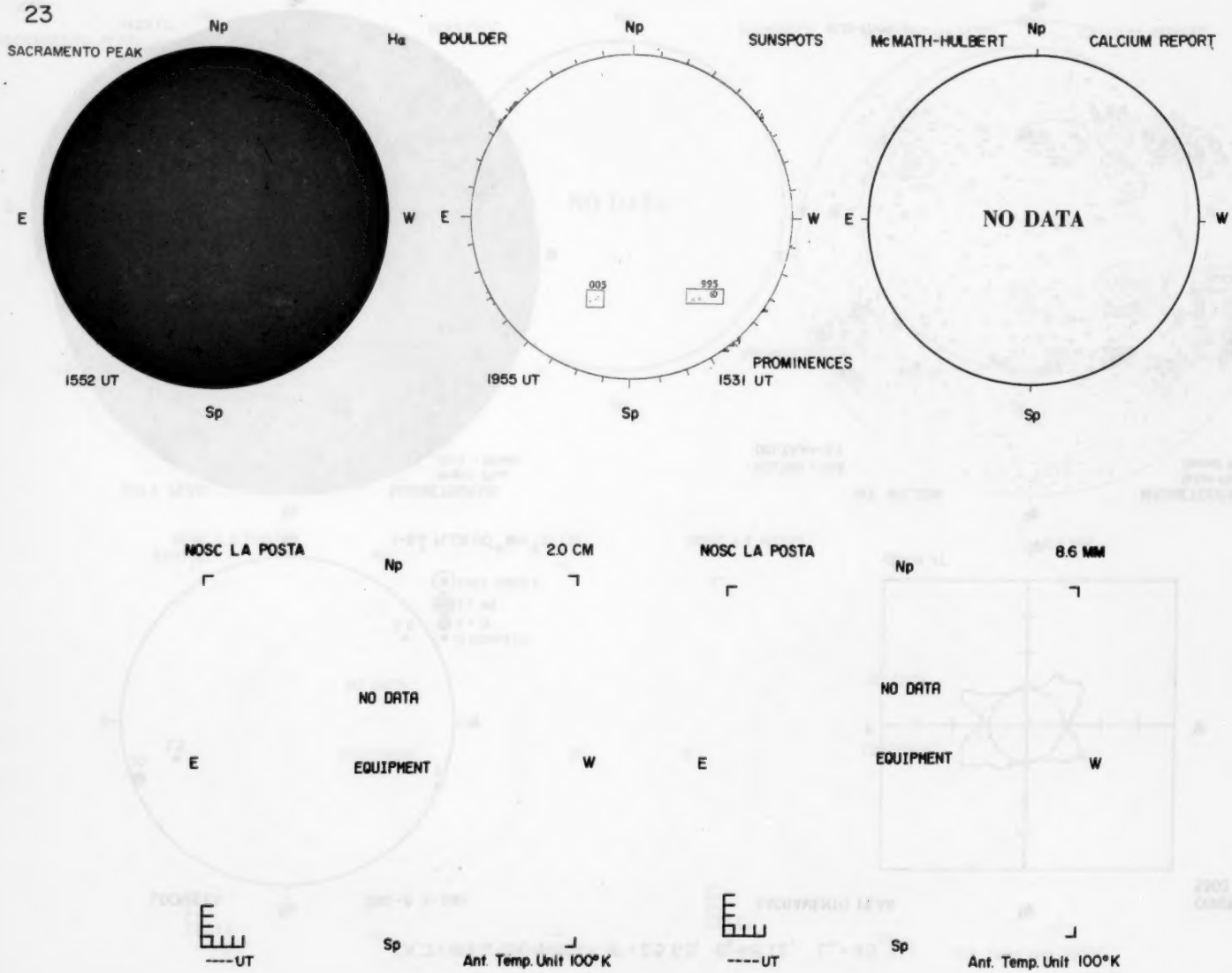
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY = 12.6
DELTAX = 9.4

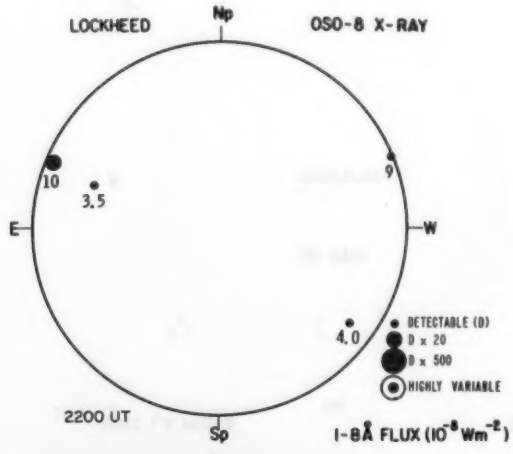


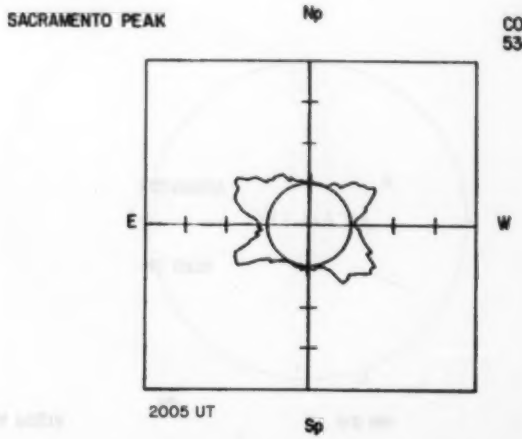
16.09-17.56 UT

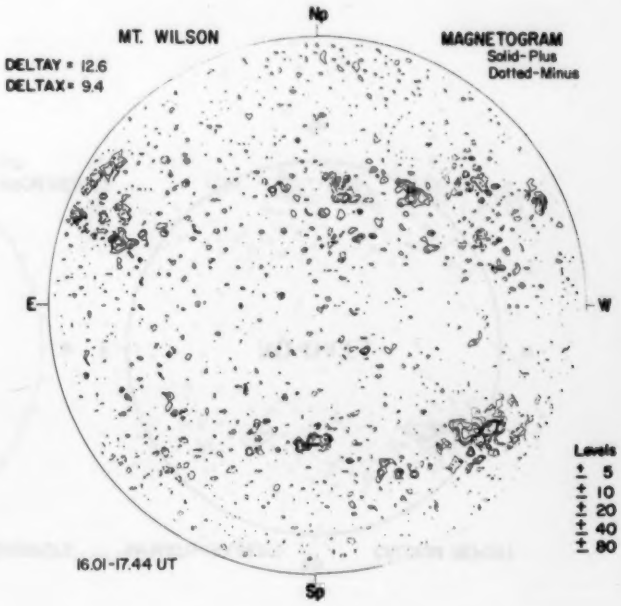
23


SACRAMENTO PEAK
Np
Hα
E
W
1552 UT
Sp
BOULDER
Np
SUNSPOTS
E
W
005
995
PROMINENCES
1955 UT
1531 UT
Sp
McMATH-HULBERT
Np
CALCIUM REPORT
E
NO DATA
W
Sp
NOSC LA POSTA
Np
2.0 CM
NO DATA
E
EQUIPMENT
W
----UT
Sp
Ant. Temp. Unit 100°K
NOSC LA POSTA
Np
8.6 MM
NO DATA
E
EQUIPMENT
W
----UT
Sp
Ant. Temp. Unit 100°K

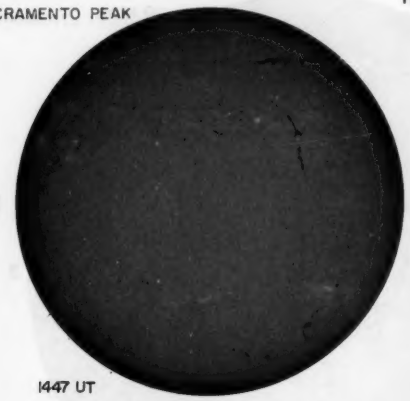
OCTOBER 24, 1977 (P = 25.63, B_o = 5.12, L_o = 49.71)





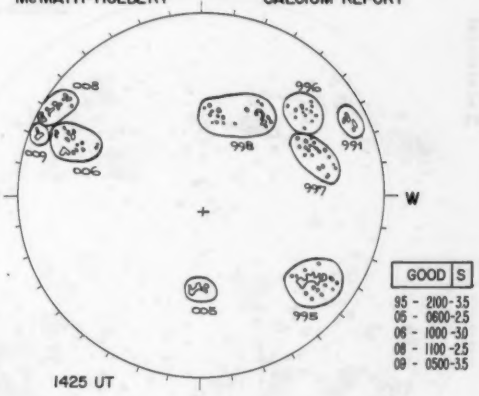


SACRAMENTO PEAK Hα



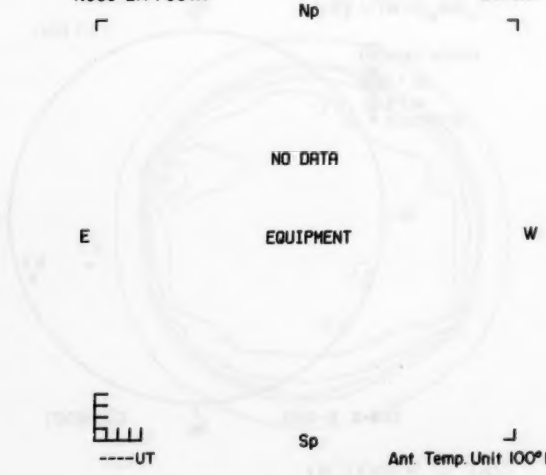
BOULDER SUNSPOTS

McMATH-HULBERT CALCIUM REPORT



PROMINENCES

NOSC LA POSTA 2.0 CM

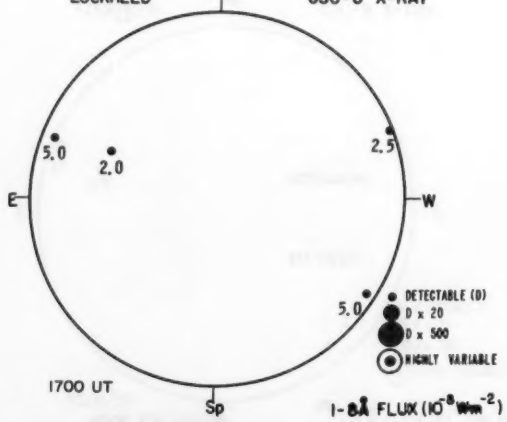


NOSC LA POSTA 8.6 MM

77 Oct 77

OCTOBER 25, 1977 (P = 25.52, B_o = 5.03, L_o = 36.52)

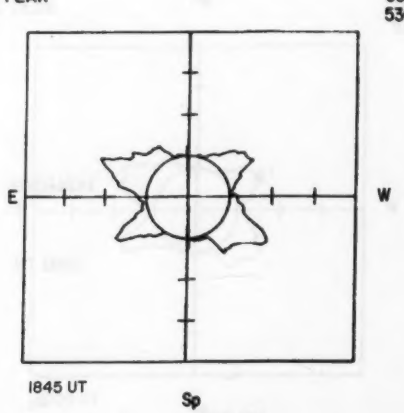
LOCKHEED OSO-8 X-RAY



1700 UT

1-8Å FLUX (10^{-8} Wm^{-2})

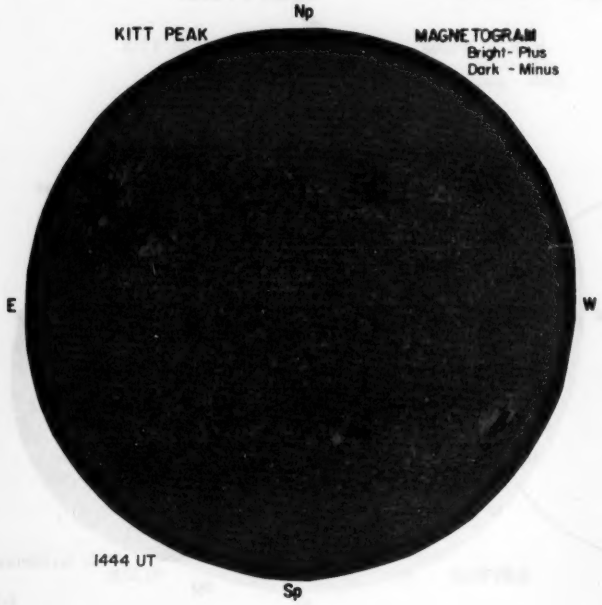
SACRAMENTO PEAK



CORONA (1.15 $R_\odot$)
5303 Å

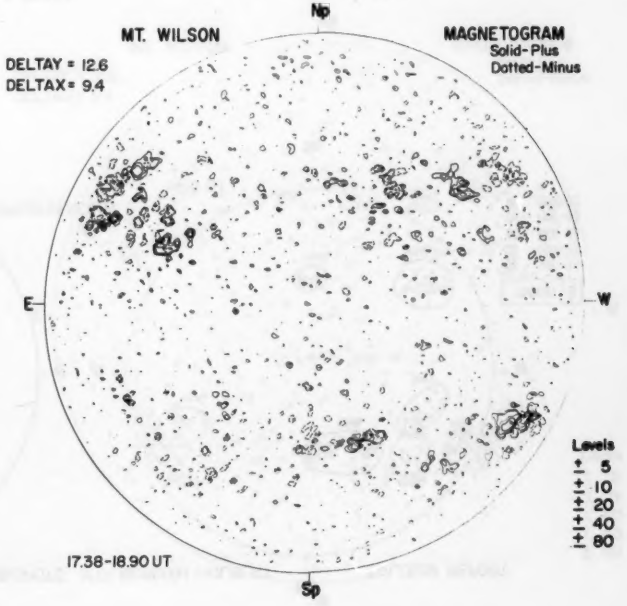
1845 UT

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



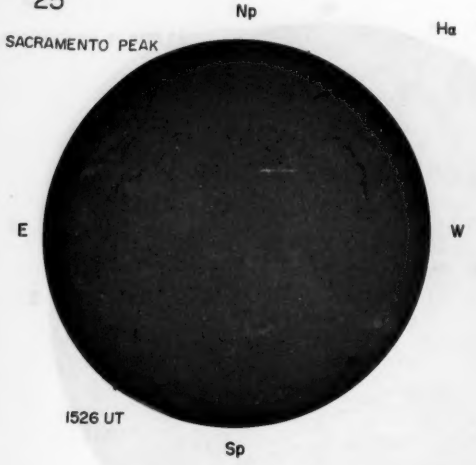
1444 UT

MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.6
DELTAX = 9.4

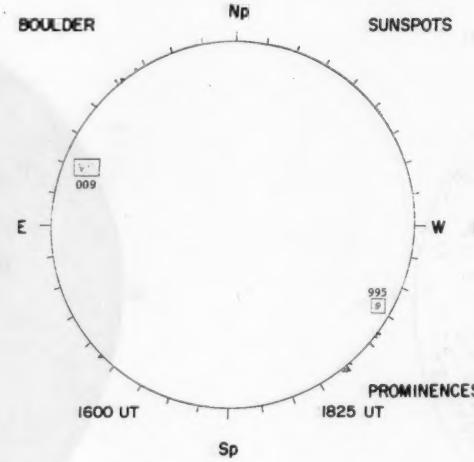


17.38-18.90 UT

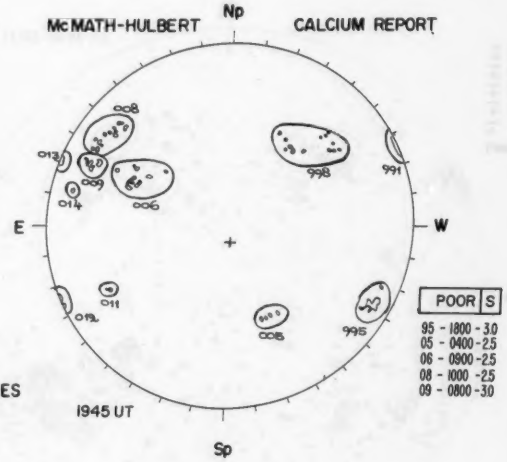
SACRAMENTO PEAK



Hα BOULDER



SUNSPOTS



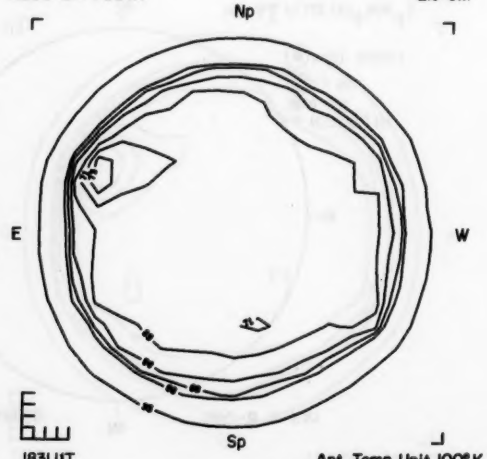
McMATH-HULBERT

CALCIUM REPORT

POOR	S

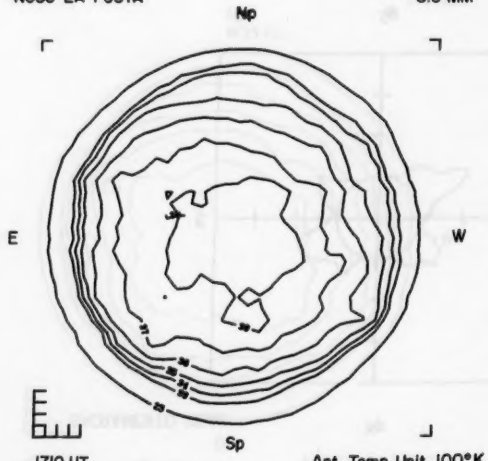
95 - 1800 - 3.0
05 - 0400 - 2.5
06 - 0900 - 2.5
08 - 1000 - 2.5
09 - 0800 - 3.0

NOSC LA POSTA 2.0 CM



Ant. Temp. Unit 100°K

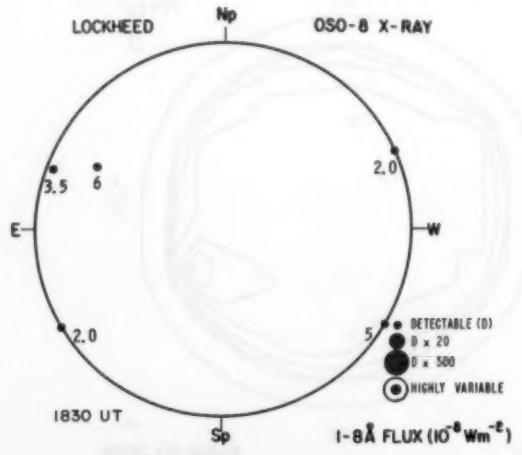
NOSC LA POSTA 8.6 MM

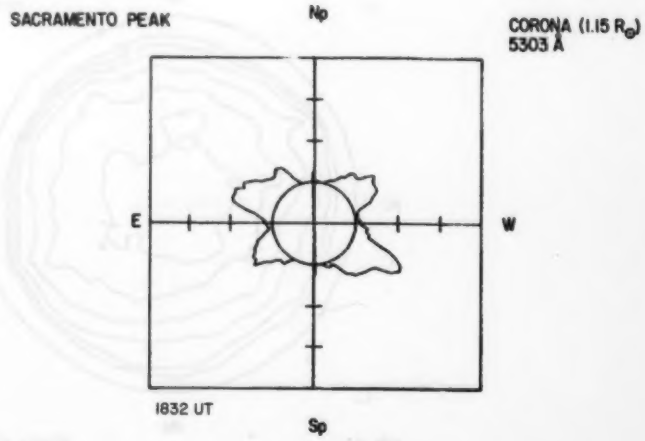


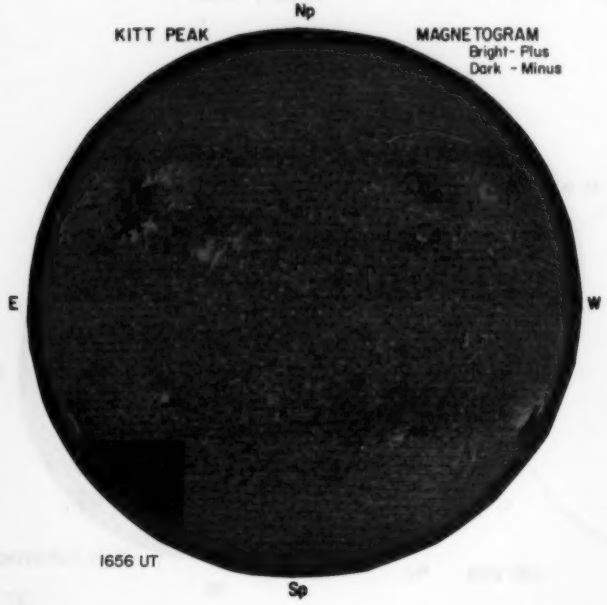
Ant. Temp. Unit 100°K

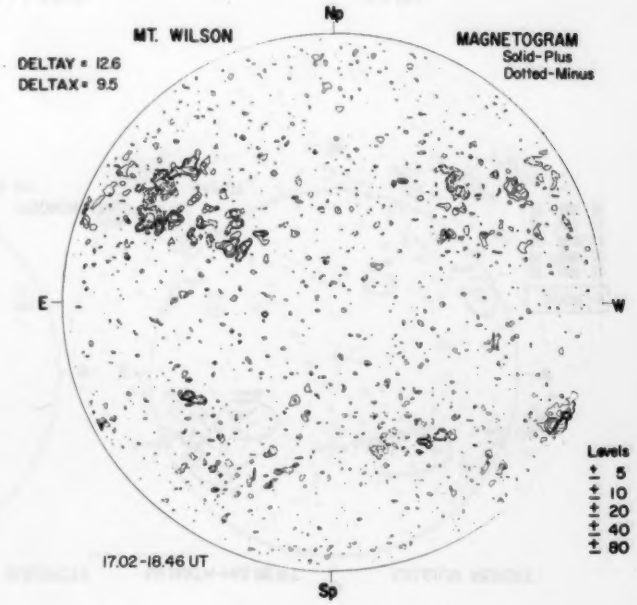
79 Oct 77

OCTOBER 26, 1977 (P = 25.41, B_o = 4.94, L_o = 23.33)

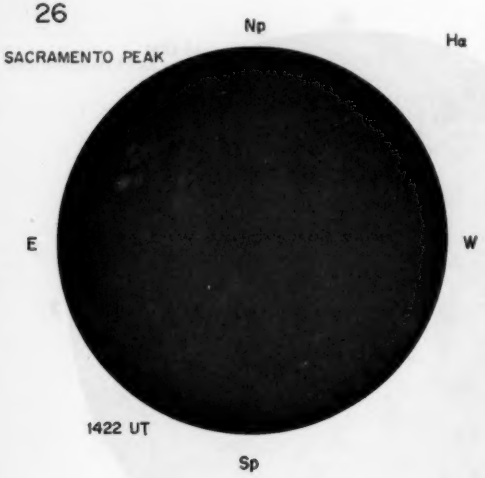




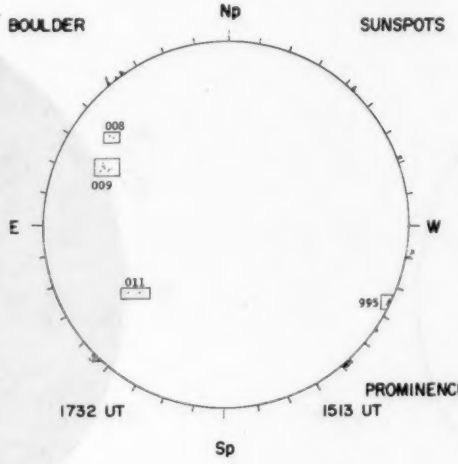




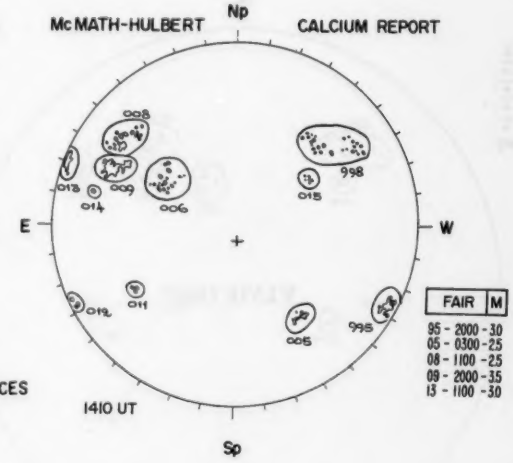
SACRAMENTO PEAK



Hα BOULDER

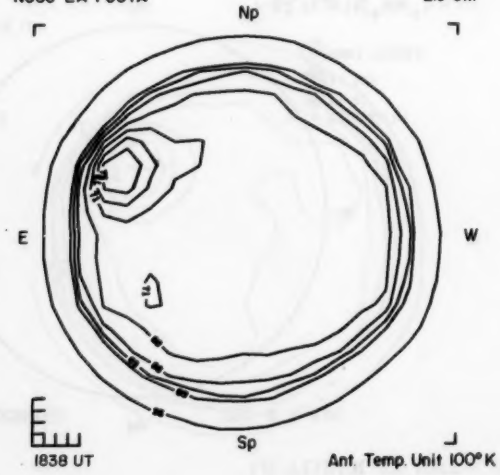


SUNSPOTS

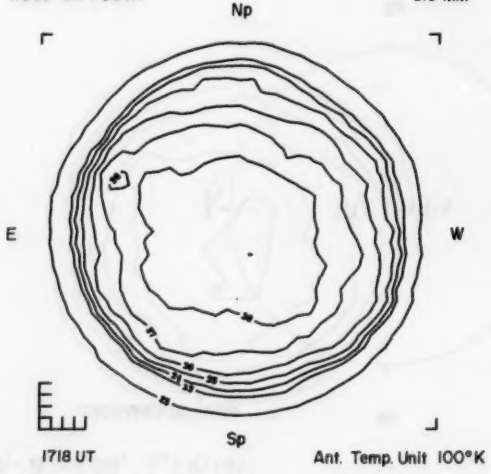


McMATH-HULBERT CALCIUM REPORT

NOSC LA POSTA 2.0 CM

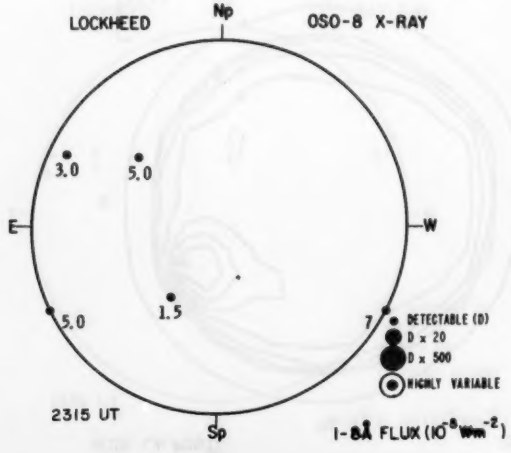


NOSC LA POSTA 8.6 MM



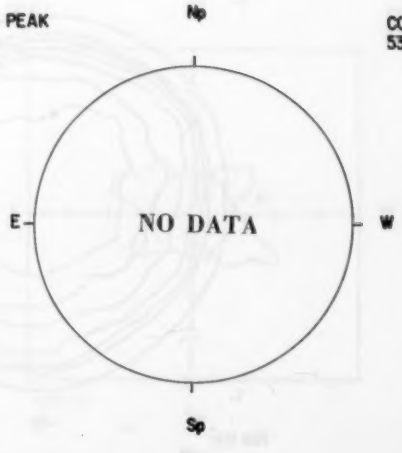
OCTOBER 27, 1977 (P = 25.29, B_o = 4.84, L_o = 10.14)

LOCKHEED OSO-8 X-RAY

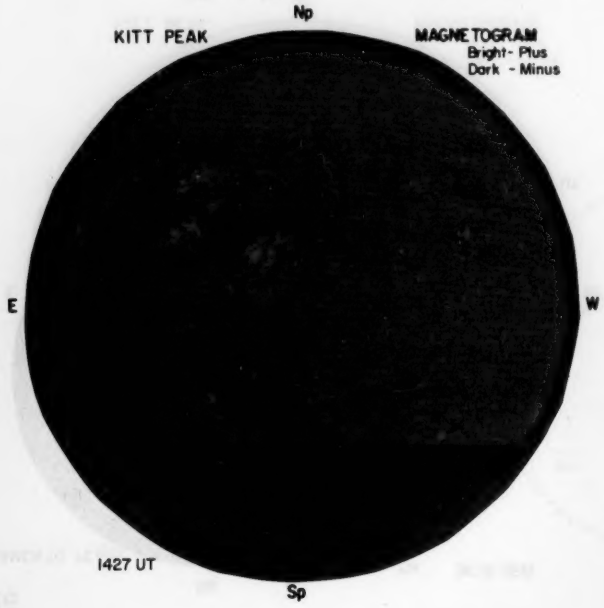


SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

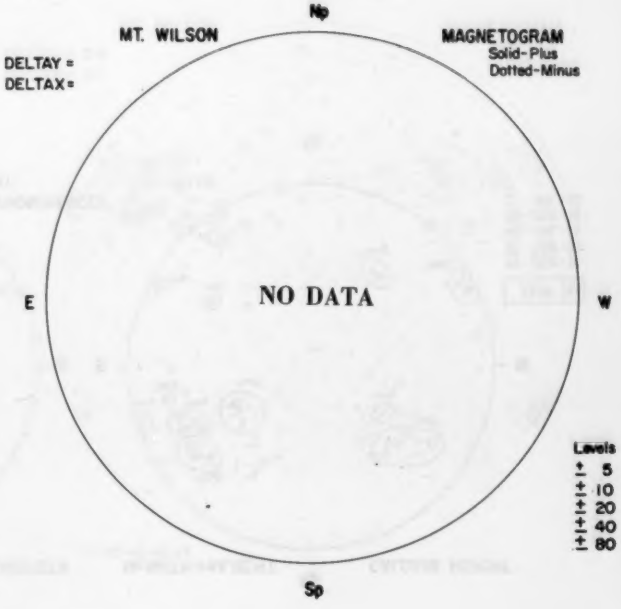


KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

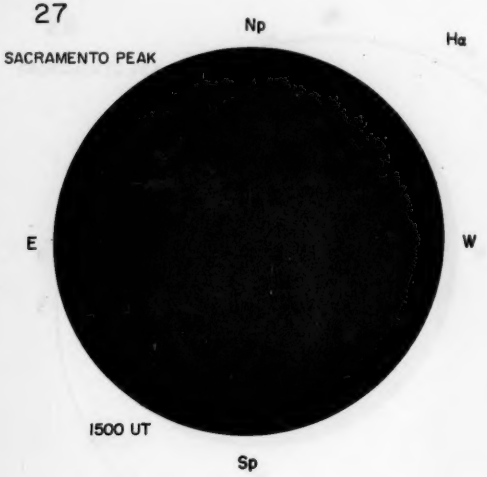


MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

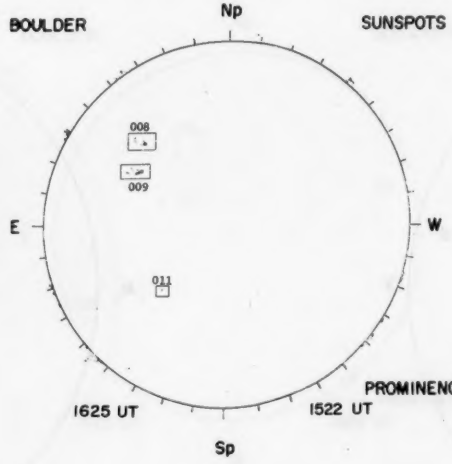
DELTAY =
DELTAX =



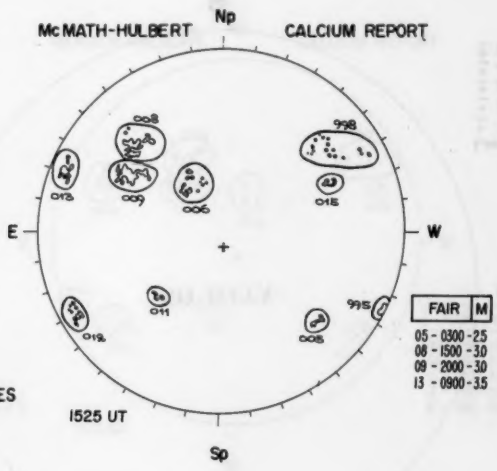
SACRAMENTO PEAK



Hα BOULDER



SUNSPOTS McMATH-HULBERT



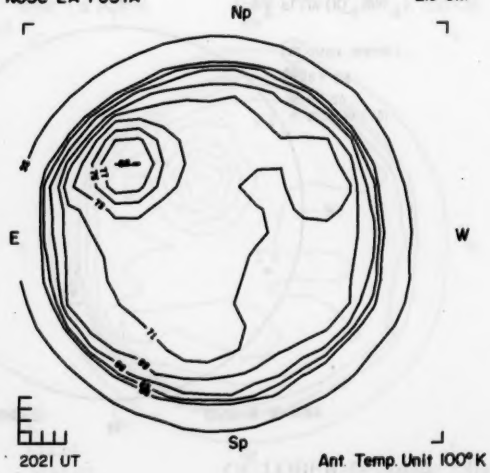
CALCIUM REPORT

FAIR	M
05 - 0300 - 2.5	
08 - 1500 - 3.0	
09 - 2000 - 3.0	
13 - 0900 - 3.5	

PROMINENCES

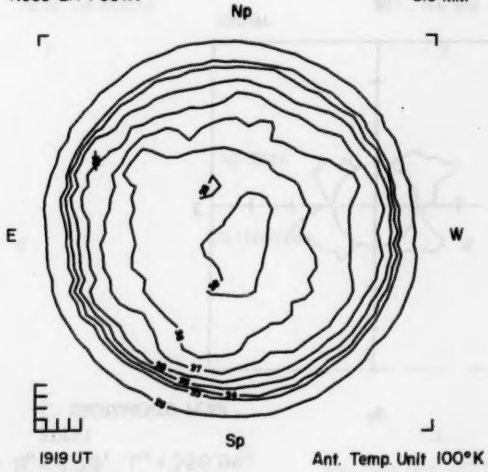
1522 UT

NOSC LA POSTA 2.0 CM



Ant. Temp. Unit 100°K

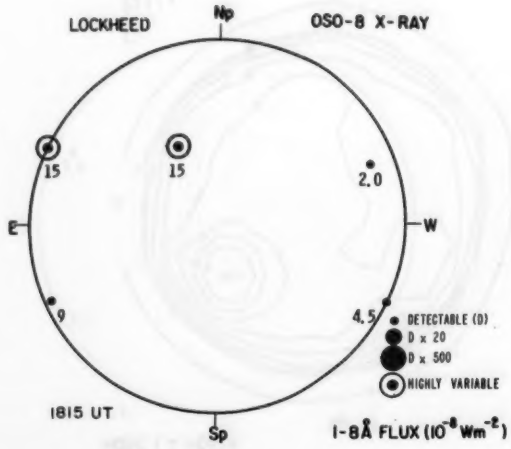
NOSC LA POSTA 8.6 MM



Ant. Temp. Unit 100°K

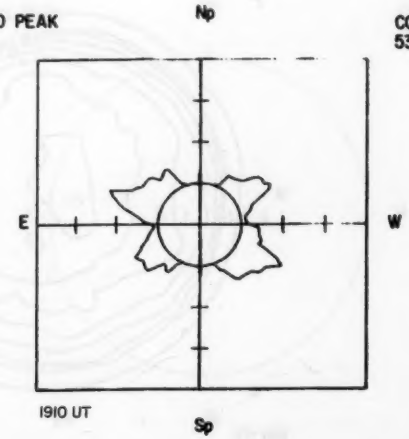
OCTOBER 28, 1977 (P = 25.16, B_o = 4.75, L_o = 356.96)

LOCKHEED OSO-8 X-RAY

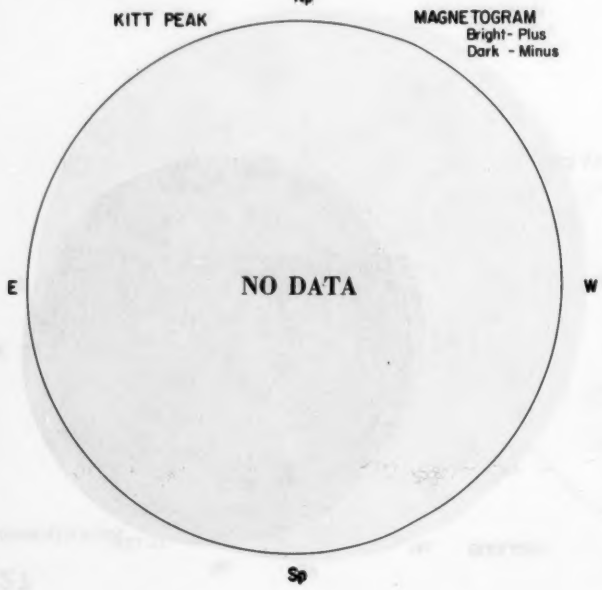


1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å

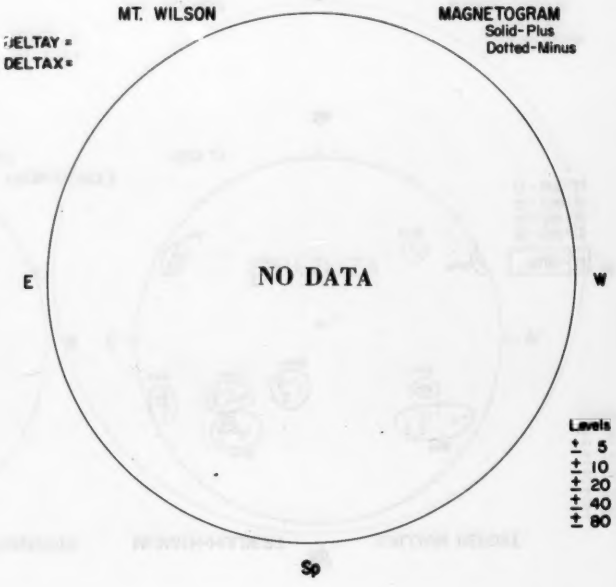


KITT PEAK MAGNETOGRAM
Bright- Plus
Dark - Minus



MT. WILSON MAGNETOGRAM
Solid- Plus
Dotted- Minus

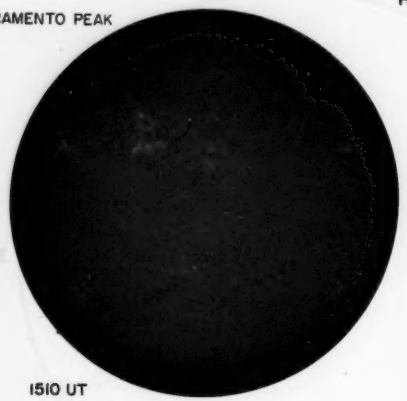
DELTAY =
DELTAX =



SACRAMENTO PEAK

Np

Hα



E W

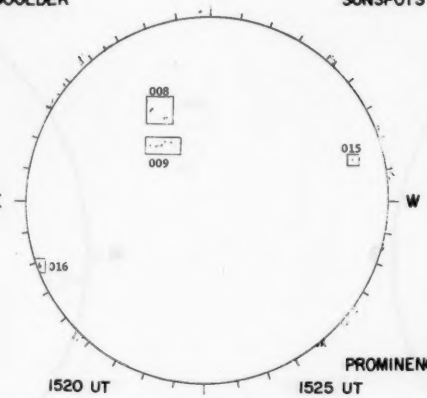
1510 UT

Sp

BOULDER

SUNSPOTS

Np



E W

1520 UT

Sp

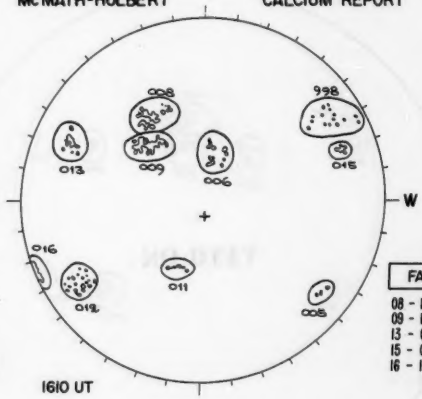
PROMINENCES

1525 UT

McMATH-HULBERT

CALCIUM REPORT

Np



E W

1610 UT

Sp

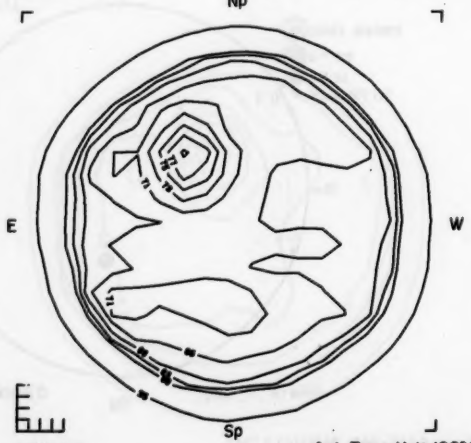
FAIR M

08 - 1500 - 30
09 - 1800 - 30
13 - 0900 - 30
15 - 0300 - 25
16 - 1600 - 30

NOSC LA POSTA

2.0 CM

Np



E W

Sp

2035 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

Np

NO DATA

CALIBRATION

E W

Sp

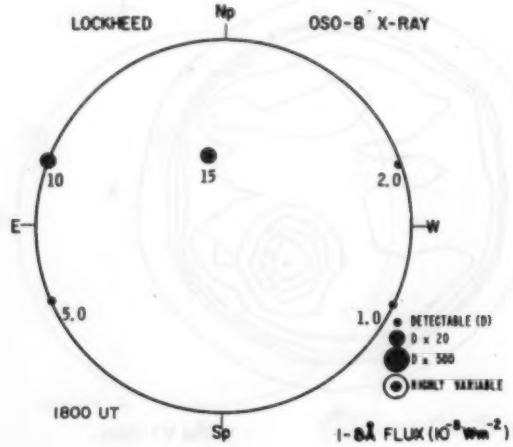
----UT

Ant. Temp. Unit 100°K

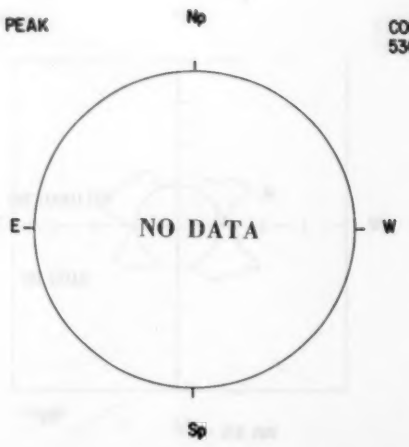
85
Oct 77

OCTOBER 29, 1977 (P = 25.02, B_o = 4.65, L_o = 343.77)

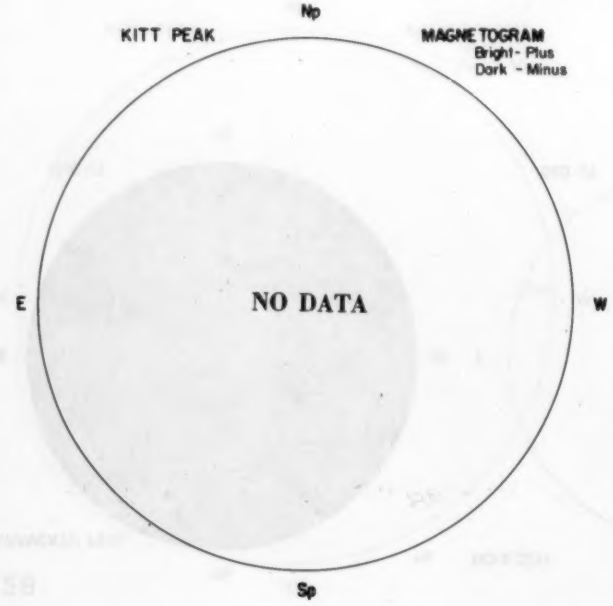
LOCKHEED OSO-8 X-RAY



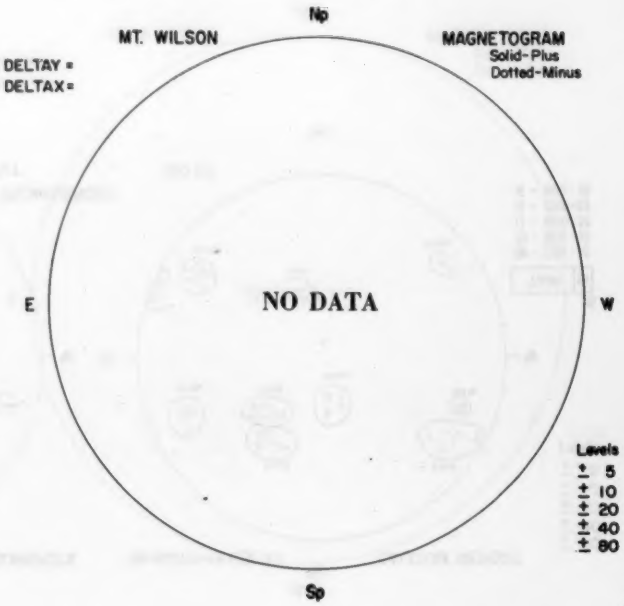
SACRAMENTO PEAK



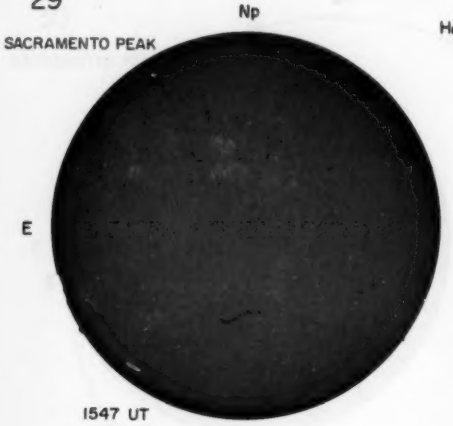
KITT PEAK



MT. WILSON

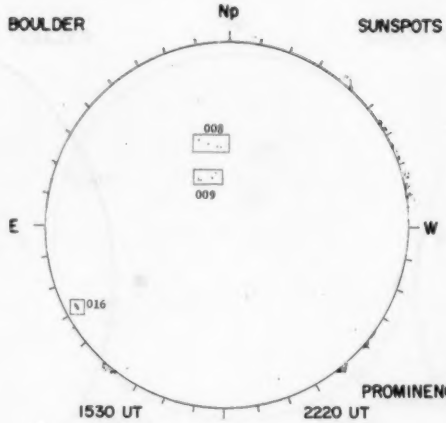


SACRAMENTO PEAK



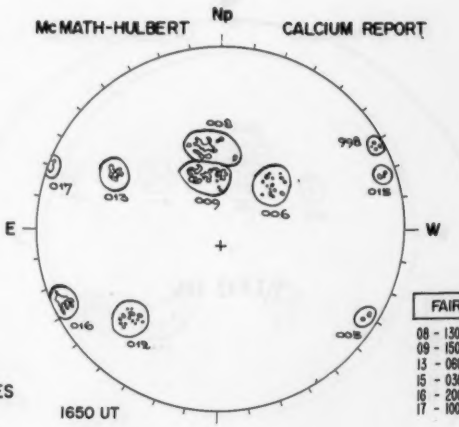
1547 UT

Hα BOULDER



1530 UT

SUNSPOTS



1650 UT

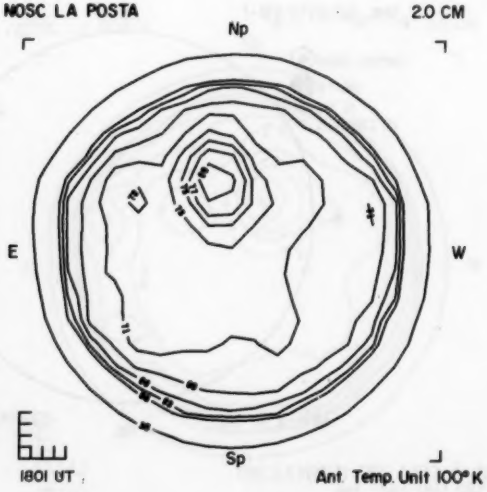
McMATH-HULBERT CALCIUM REPORT

FAIR	M
08 - 1300 - 2.5	
09 - 1500 - 2.5	
13 - 0800 - 2.5	
15 - 0300 - 2.5	
16 - 2000 - 3.0	
17 - 1000 - 3.5	

PROMINENCES

2220 UT

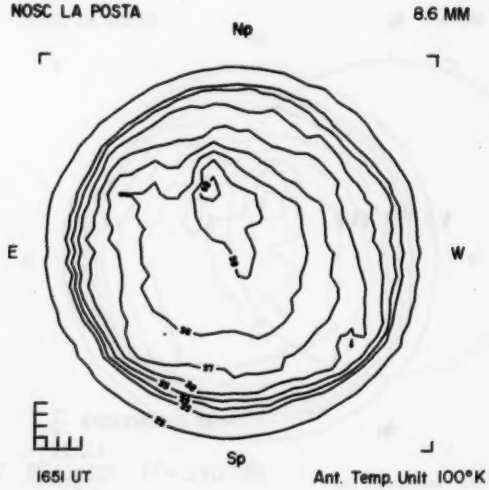
NOSC LA POSTA 2.0 CM



1801 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM



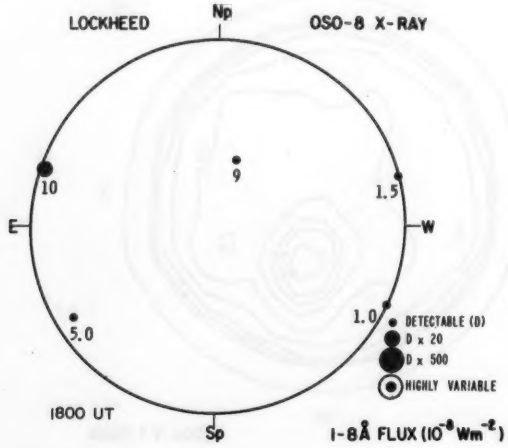
1651 UT

Ant. Temp. Unit 100°K

87
Oct 77

OCTOBER 30, 1977 (P = 24.87, B_o = 4.55, L_o = 330.58)

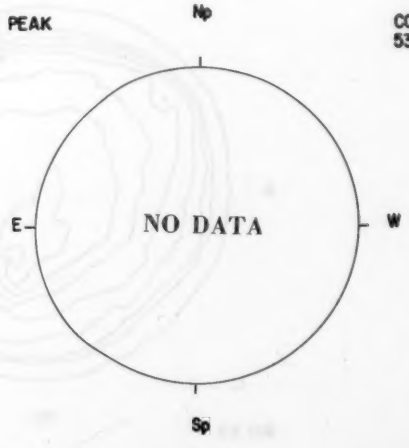
LOCKHEED OSO-8 X-RAY



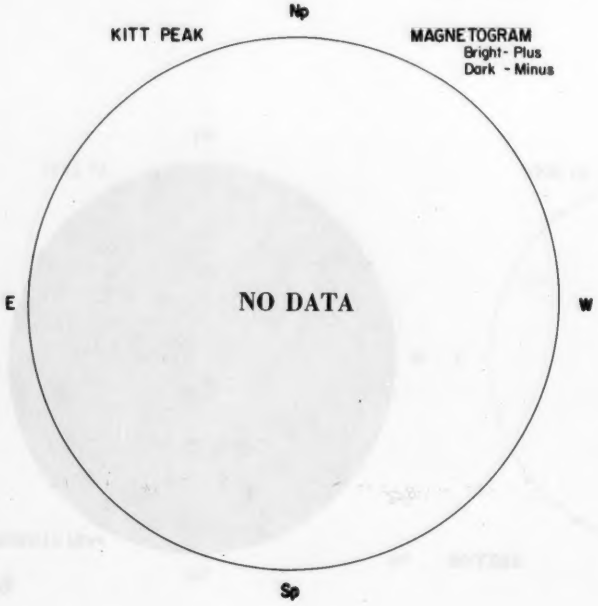
1800 UT

I-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å

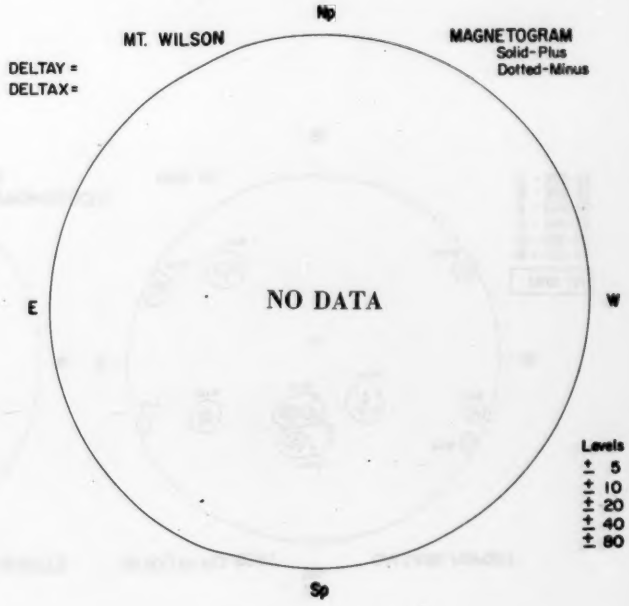


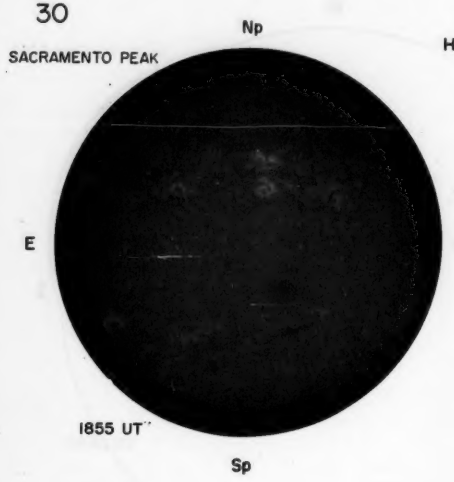
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

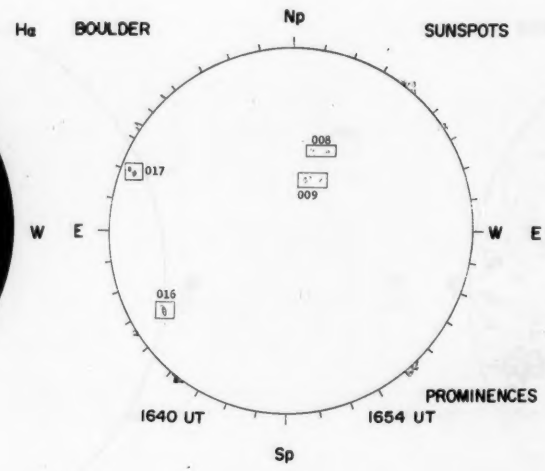


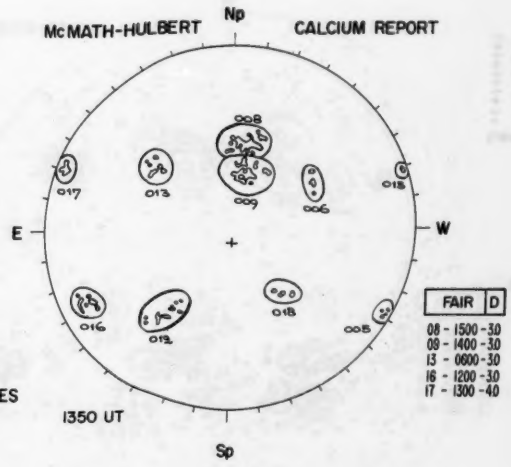
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

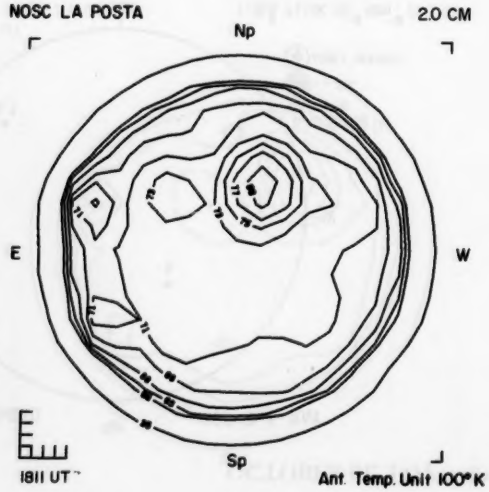
DELTAY =
DELTAX =

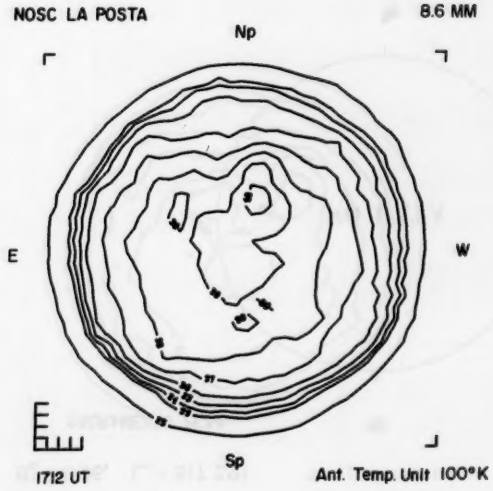



SACRAMENTO PEAK
Np
E
W
Sp
1855 UT

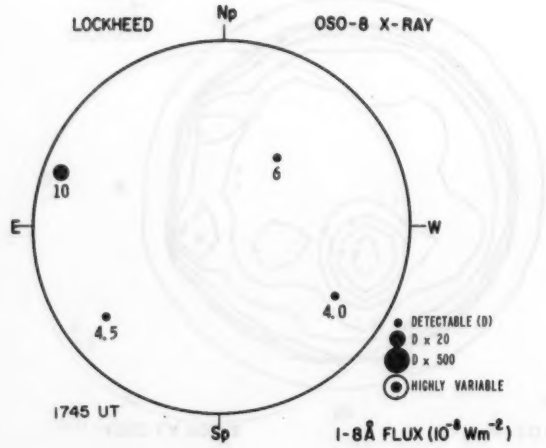

Hα BOULDER
SUNSPOTS
Np
E
W
Sp
008
017
009
016
1640 UT
1654 UT

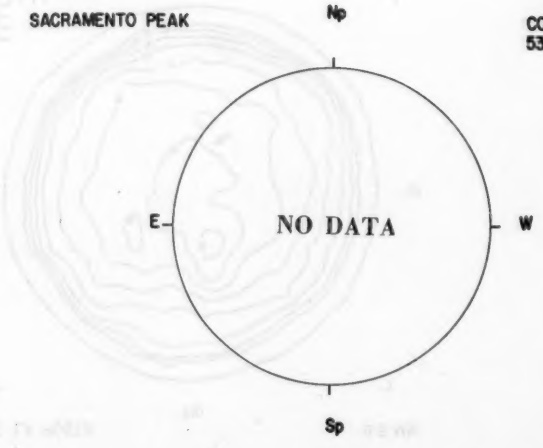

McMATH-HULBERT
CALCIUM REPORT
Np
E
W
Sp
008
017
013
009
006
018
016
012
005
1350 UT
PROMINENCES
FAIR D
08 - 1500 - 30
09 - 1400 - 30
13 - 0600 - 30
16 - 1200 - 30
17 - 1300 - 40

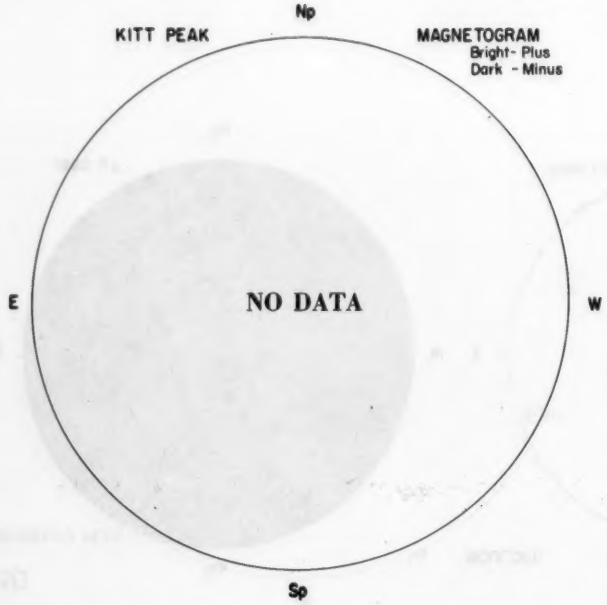

NOSC LA POSTA
2.0 CM
Np
E
W
Sp
1811 UT
Ant. Temp. Unit 100°K

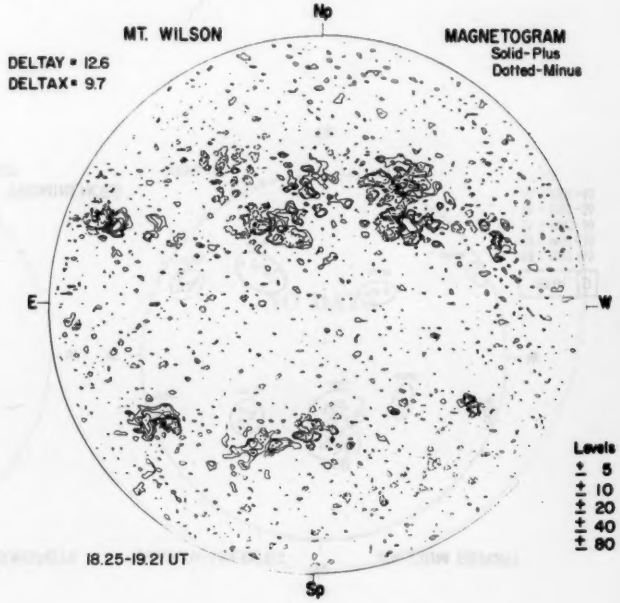

NOSC LA POSTA
8.6 MM
Np
E
W
Sp
1712 UT
Ant. Temp. Unit 100°K

OCTOBER 31, 1977 (P = 24.72, B_o = 4.46, L_o = 317.39)



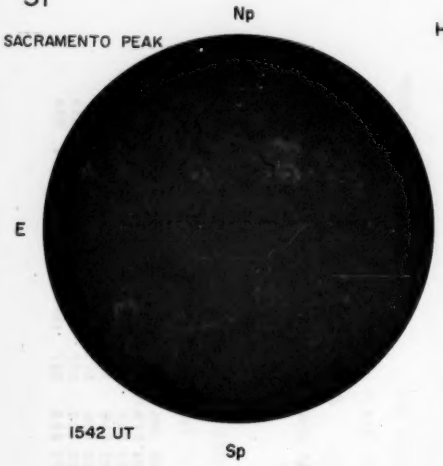






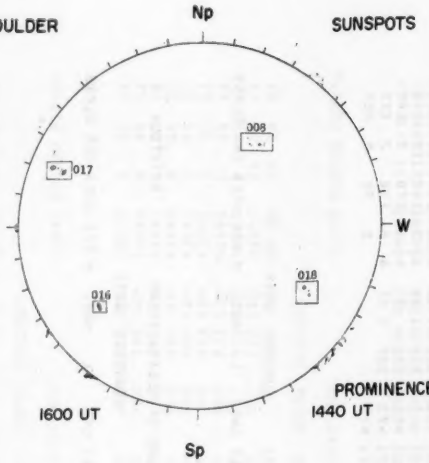
31

SACRAMENTO PEAK



1542 UT

Hα BOULDER



1600 UT

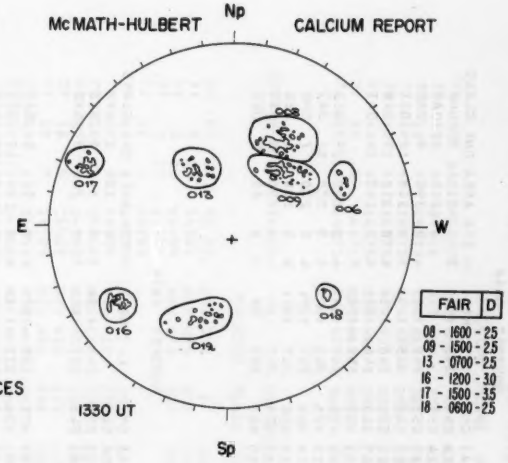
SUNSPOTS

PROMINENCES

1440 UT

McMATH-HULBERT

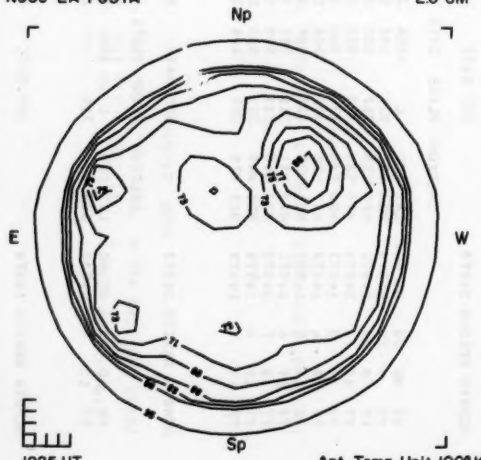
CALCIUM REPORT



1330 UT

FAIR	D
08 - 1600 - 25	
09 - 1500 - 25	
13 - 0700 - 25	
16 - 1200 - 30	
17 - 1500 - 35	
18 - 0600 - 25	

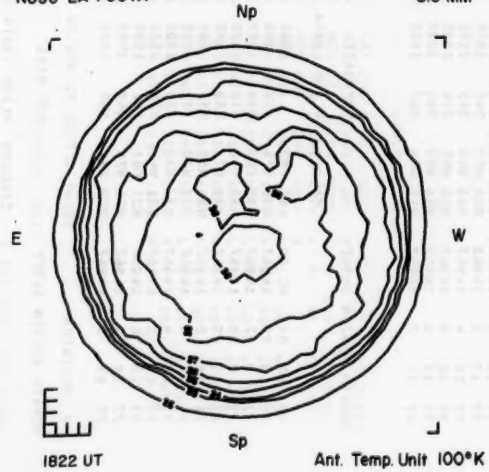
NOSC LA POSTA 2.0 CM



1925 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM



1822 UT

Ant. Temp. Unit 100°K

91
Oct 77

REGIONS OF SOLAR ACTIVITY

OCTOBER 1977

HCMATH REGION 14963 CMP DATE 1.6 RETURN OF REGION 14935 ROTATION 2

CALCIUM PLAGE DATA								SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	9	25	14963	N16 E82	344	1400	4.0	19856	N16 E80	345	(B)	3	B	330	3	HHC
77	9	26	14963	N16 E68	345	2200	4.0		N14 E55				B	240	8	DAO
77	9	27	14963	N16 E55	345	2000	4.0	19856	N15 E53	345	(B)	4	B	390	5	DKO
77	9	28	14963	N16 E42	345	2000	3.5	19856	N15 E40	345	(B)	5	H	300	12	DSI
77	9	29	14963	N16 E25	345	2000	3.5	19856	N15 E26	346	(B)	4	B	310	15	DKO
77	9	30	14963					19856	N15 E13	346	(BP)	4	R	140	14	DAI
77	10	1	14963					19856	N15 W02	346	(BP)	5				
77	10	2	14963	N16 W12	344	1800	3.5	19856	N15 W15	345	(BP)	4	B	200	25	DSI
77	10	3	14963	N16 W27	345	1500	3.5	19856	N15 W28	345	(BP)	4	B	220	11	DAI
77	10	4	14963	N16 W40	345	2100	3.0	19856	N15 W44	347	(BP)	4	B	230	7	CHO
77	10	5	14963	N16 W55	345	1900	3.0	19856	N15 W56	347	(AP)	4	B	130	1	HSX
77	10	6	14963	N16 W68	348	1800	3.0	19856	N15 W70	347	AP	4	B	200	1	HSX
77	10	7	14963	N16 W81	347	1800	3.0	19856	N15 W83	347	AP	3	B	80	1	HSX

HCMATH REGION 14967 CMP DATE 2.1

CALCIUM PLAGE DATA								SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	9	26	14967	N34 E74	339	200	3.5		N34 E60				B	10	2	AXX
77	9	27	14967	N35 E62	338	500	2.5	19858	N33 E58	340	(B)	3	B	30	2	BXO
77	9	28	14967	N34 E49	338	600	2.5	19858	N33 E48	337	(AF)	3	H	20	3	BXO
77	9	29	14967	N34 E31	339	400	2.0									
77	10	2	14967	N34 W05	337	500	1.5									
77	10	3	14967	N33 W20	338	800	3.5	19863	N33 W21	338	(BP)	4	B	90	9	DAI
77	10	4	14967	N33 W33	338	1300	3.0	19863	N32 W34	337	(B)	4	B	190	10	DSI
77	10	5	14967	N31 W48	338	1500	3.5	19863	N31 W47	338	(B)	5	B	160	10	DAO
77	10	6	14967	N31 W61	341	1500	3.5	19863	N31 W61	338	B	4	B	270	8	EAO
77	10	7	14967	N31 W74	340	1900	3.5	19863	N31 W73	337	(B)	4	B	120	2	EAO
77	10	8	14967	N29 W87	338	1400	2.5		N30 W87				B	70	1	HSX

HCMATH REGION 14972 CMP DATE 3.2

CALCIUM PLAGE DATA								SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	9	29	14972	S36 E55	315	300	2.5									

HCMATH REGION 14973 CMP DATE 4.2 RETURN OF REGION 14930 ROTATION 3

CALCIUM PLAGE DATA								SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	9	28	14973	N26 E72	315	600	1.0									
77	9	29	14973	N26 E58	312	800	1.0									
77	10	2	14973	N26 E20	312	800	2.0									
77	10	3	14973	N26 E08	310	900	1.5									
77	10	4	14973	N27 W06	311	500	1.5									
77	10	5	14973	N27 W22	312	500	1.0									
77	10	6	14973	N28 W31	311	500	1.0									
77	10	7	14973	N28 W45	311	500	1.0									
77	10	8	14973	N28 W60	311	500	1.0									
77	10	9	14973	N28 W75	312	400	1.0									

HCMATH REGION 14983 CMP DATE 4.2

CALCIUM PLAGE DATA								SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	7	14983	S35 W44	310	100	1.5									

HCMATH REGION 14970 CMP DATE 4.9

CALCIUM PLAGE DATA								SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	9	28	14970	S22 E81	306	1200	3.0	19860	S21 E78	307	AP	3				
77	9	29	14970	S22 E66	304	1800	3.0	19860	S22 E63	309	(BP)	4	B	300	3	CSO
77	9	30	14970					19860	S21 E49	310	(BP)	4	R	130	3	CSO
77	10	1	14970					19860	S20 E36	308	(AP)	4				
77	10	2	14970	S22 E38	302	2000	3.0	19860	S20 E23	307	(AP)	4	B	150	1	HSX
77	10	3	14970	S22 E16	302	2000	3.0	19860	S20 E10	307	(AP)	5	B	160	1	HSX

Cont'd

REGIONS OF SOLAR ACTIVITY

OCTOBER 1977

MCMATH REGION 14970 (CONT) CMP DATE 4.9

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	4	14970	S23 E04	301	2000	3.0	19860	S20 W03	306	(AP)	4	B	100	1	HAX
77	10	5	14970	S24 W10	300	1900	3.0	19860	S22 W16	307	(AP)	4	B	80	2	HAX
77	10	6	14970	S24 W22	302	1800	3.0	19860	S21 W30	307	AP	4	B	150	2	HSX
77	10	7	14970	S24 W35	301	1900	3.0	19860	S21 W42	306	(AP)	4	B	60	2	HAX
77	10	8	14970	S25 W49	300	1800	3.0	19860	S21 W56	306	(AP)	4	B	60	2	HAX
77	10	9	14970	S24 W64	301	1800	3.0	19860	S21 W68	307	(AP)	3	B	10	1	AXX
77	10	10	14970	S24 W77	303	1400	3.0	19860	S20 W79	305	(AP)	2				

MCMATH REGION 14969 CMP DATE 5.2

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	9	28	14969	N21 E84	303	1000	3.0	19859	N21 E87	298	AP	3				
77	9	29	14969	N20 E70	300	1400	3.0	19859	N21 E73	299	(BP)	4	B	130	2	CSO
77	9	30	14969					19859	N20 E58	301	(BP)	4	R	80	2	CSO
77	10	1	14969					19859	N20 E45	299	(BP)	3				
77	10	2	14969	N21 E34	298	1200	3.0	19859	N21 E31	299	(AP)	4	B	40	4	CSO
77	10	3	14969	N21 E22	296	1200	3.0	19859	N21 E18	299	(AP)	4	B	50	1	HSX
77	10	4	14969	N21 E08	297	1100	3.0	19859	N21 E04	299	(AP)	4	B	40	4	CSO
77	10	5	14969	N20 W07	297	900	2.5	19859	N20 W09	300	(AP)	4	B	40	1	HSX
77	10	6	14969	N21 W19	299	1000	2.5	19859	N20 W23	300	(AP)	4	B	80	1	HSX
77	10	7	14969	N21 W32	298	1000	2.5	19859	N20 W35	299	(AP)	4	B	30	1	HSX
77	10	8	14969	N20 W47	298	800	2.5	19859	N20 W48	298	(AP)	4	B	30	1	HSX
77	10	9	14969	N21 W62	299	700	3.0	19859	N20 W61	300	(AP)	3	B	20	1	HRX
77	10	10	14969	N21 W73	299	700	3.0	19859	N20 W72	298	(AP)	2				
77	10	11	14969	N22 W88	298	300	1.0									

MCMATH REGION 14974 CMP DATE 5.2 RETURN OF REGION 14930 ROTATION 3

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	9	29	14974	N33 E72	298	500	1.0									
77	10	2	14974	N33 E34	298	500	2.0									
77	10	3	14974	N33 E20	298	600	1.5	19864	N34 E16	301	(AF)	1				
77	10	4	14974	N33 E08	297	600	1.5									
77	10	5	14974	N33 W06	296	500	1.5									
77	10	6	14974	N33 W18	298	700	1.0									
77	10	7	14974	N33 W31	297	600	1.0									
77	10	8	14974	N33 W45	296	500	1.0									
77	10	9	14974	N33 W60	297	500	1.0									

MCMATH REGION 14977 CMP DATE 7.6

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	4	14977	N30 E40	265	300	2.0									
77	10	5	14977	N30 E25	265	100	1.0									

MCMATH REGION 14988 CMP DATE 7.7

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	12	14988	N20 W63	263	300	2.5	19869	N20 W61	260	(AP)	2				
77	10	13	14988	N20 W76	262	600	2.0		N18 W50				B	20	1	AXX
77	10	14	14988	N20 W90	263	300	1.0									

MCMATH REGION 14981 CMP DATE 8.1

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	7	14981	N39 E08	258	100	1.5									

REGIONS OF SOLAR ACTIVITY

OCTOBER 1977

MCMATH REGION 14982 CMP DATE 8.3

CALCIUM PLAGE DATA							SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	7	14982	S34 E10	256	200	2.0	19865	S34 E08	256	(BP)	2	B	20	3	BRO
77	10	8	14982	S34 W03	254	100	2.0									
77	10	9	14982	S34 W19	256	200	1.5									

MCMATH REGION 14975 CMP DATE 8.7 RETURN OF REGION 14941 ROTATION 4

CALCIUM PLAGE DATA							SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	2	14975	N21 E78	254	600	2.0	19862	N18 E76	254	(AP)	3	B	10	1	AXX
77	10	3	14975	N21 E63	255	600	2.0									
77	10	4	14975	N23 E55	250	600	1.5									
77	10	5	14975	N23 E40	250	400	1.0									
77	10	6	14975	N23 E30	250	600	1.0									
77	10	7	14975	N24 E16	250	500	1.0									
77	10	8	14975	N24 E01	250	300	1.5									
77	10	9	14975	N24 W13	250	400	1.0									

MCMATH REGION 14978 CMP DATE 9.8 RETURN OF REGION 14941 ROTATION 4

CALCIUM PLAGE DATA							SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	4	14978	N17 E70	235	500	1.0									
77	10	5	14978	N17 E55	235	300	1.0									
77	10	6	14978	N17 E41	239	500	1.5									
77	10	7	14978	N17 E29	237	400	1.0									
77	10	8	14978	N19 E16	235	400	1.0									
77	10	9	14978	N19 E01	236	400	1.0									

MCMATH REGION 14989 CMP DATE 10.3

CALCIUM PLAGE DATA							SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	12	14989	N02 W29	229	100	1.0									

MCMATH REGION 14979 CMP DATE 12.3 RETURN OF REGION 14942 ROTATION 2

CALCIUM PLAGE DATA							SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	5	14979	N15 E88	202	5000	3.5	19864	N07 E85	206	Y	4	B	60	2	HSX
77	10	6	14979	N13 E78	202	6500	3.5	19864	N05 E72	205	Y	4	B	450	9	DAI
77	10	7	14979	N13 E66	200	7300	3.5	19864	N06 E59	205	(Y)	3	B	260	10	DAI
77	10		14979					19866	N15 E60	204	(AF)	1	B	10	1	AXX
77	10	8	14979	N13 E52	199	8000	3.5	19864	N06 E45	205	(D)	3	B	310	19	DAI
77	10		14979						N12 E46				B	20	6	BXO
77	10	9	14979	N13 E36	201	8000	3.5	19864	N06 E33	206	(D)	4	B	300	17	DAI
77	10	10	14979	N13 E22	204	7500	3.5	19864	N07 E19	207	(D)	4				
77	10		14979					19866	N16 E21	205	(AF)	2				
77	10		14979					19868	N12 E18	208	(AF)	2				
77	10	11	14979	N13 E06	204	7200	3.5	19864	N07 E05	208	(D)	4	B	160	16	DAO
77	10		14979					19866	N17 W01	214	(AP)	1				
77	10	12	14979	N13 W04	204	7500	3.5	19864	N07 W07	206	(D)	3	B	160	28	DAI
77	10	13	14979	N13 W16	202	7500	3.5	19864	N06 W22	207	(Y)	4	B	220	32	DAI
77	10	14	14979	N12 W29	202	6900	3.5	19864	N06 W35	207	(Y)	4	B	80	11	CRI
77	10	15	14979					19864	N04 W48	207	(B)	3	B	40	2	CRO
77	10	16	14979	N12 W55	202	6000	3.0		N06 W67				B	20	2	CRO
77	10	17	14979	N10 W70	203	5200	2.5									
77	10	18	14979	N10 W83	203	2200	2.0									

MCMATH REGION 14987 CMP DATE 12.7

CALCIUM PLAGE DATA							SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	11	14987	N36 E12	198	100	1.5									

REGIONS OF SOLAR ACTIVITY

OCTOBER 1977

MCMATH REGION 14990 CMP DATE 12.7

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	12	14990	N30 E02	198	200	3.5	19870	N29 E02	197	(Y)	3	B	20	7	BFO
77	10	13	14990	N30 W11	197	400	3.0									
77	10	14	14990	N30 W24	197	300	2.5									
77	10	16	14990	N30 W50	197	200	1.0									
77	10	17	14990	N30 W67	200	200	1.0									

MCMATH REGION 14992 CMP DATE 13.3

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	13	14992	S17 W03	189	200	2.5									
77	10	14	14992	S17 W16	189	100	1.0									

MCMATH REGION 14986 CMP DATE 13.7

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	10	14986	N37 E41	185	200	1.0									

MCMATH REGION 14993 CMP DATE 14.7

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	13	14993	N19 E17	169	300	2.5	19871	N19 E14	171	(B)	3	B	20	5	BXO
77	10	14	14993	N19 E02	171	200	3.0	19871	N18 E01	171	(BP)	4	B	60	8	DAO
77	10	15	14993					19871	N18 W13	172	(B)	4	B	110	5	DAO
77	10	16	14993	N19 W25	172	800	3.0	19871	N18 W27	173	(B)	4	B	160	11	DRO
77	10	17	14993	N18 W40	173	800	3.0	19871	N18 W40	172	(BF)	3	B	20	15	BXI
77	10	18	14993	N18 W54	174	1000	3.0	19871	N18 W53	172	B	1	B	10	4	BXO
77	10	19	14993	N18 W68	173	800	3.0		N23 W62				B	10	2	BPO
77	10	20	14993	N18 W82	175	500	2.0		N23 W79				M	30	2	BXO

MCMATH REGION 15003 CMP DATE 14.8

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	19	15003	S24 W65	170	100	1.0									
77	10	20	15003	S24 W79	172	700	2.0									

MCMATH REGION 14984 CMP DATE 16.2 RETURN OF REGION 14953 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	8	14984	N22 E90	161	500	2.0									
77	10	9	14984	N21 E80	157	1800	3.0	19867	N19 E79	160	(AP)	3	B	80	1	HSX
77	10	10	14984	N21 E70	156	3000	3.0	19867	N19 E66	160	(AP)	4				
77	10	11	14984	N21 E54	156	3000	3.0	19867	N19 E53	160	(AP)	4	B	270	2	HKX
77	10	12	14984	N21 E47	153	2500	3.0	19867	N19 E39	160	(AP)	4	B	260	4	HSX
77	10	13	14984	N22 E34	152	2500	3.0	19867	N19 E26	159	(AP)	4	B	290	9	HAX
77	10	14	14984	N22 E21	152	2100	2.5	19867	N19 E13	159	(AP)	4	B	260	3	HSX
77	10	15	14984					19867	N19 W01	160	(AP)	4				
77	10		14984					19873	N23 W03	162	(AP)	3	B	220	3	HSX
77	10	16	14984	N22 W05	152	2200	2.5	19867	N18 W13	159	(BP)	4				
77	10		14984					19874	N23 E01	145	(B)	4	B	40	6	BXO
77	10	17	14984	N23 W19	152	2000	2.5	19867	N19 W27	159	(AP)	4	B	120	4	HSX
77	10		14984					19874	N23 W13	145	(BP)	2	B	50	13	DRI
77	10	18	14984	N23 W31	151	2500	3.0	19867	N19 W40	159	(AP)	4	B	100	4	HSX
77	10		14984					19874	N23 W27	146	(BP)	4	B	160	16	CSI
77	10	19	14984	N23 W45	150	3200	3.0		N23 W42				B	160	22	CAI
77	10		14984						N19 W55				B	110	1	HAX
77	10	20	14984	N23 W59	152	3800	3.5	19867	N19 W64	158	(AP)	3				
77	10		14984					19874	N22 W53	147	(BP)	3	H	140	7	DAI
77	10		14984					19877	N23 W70	164	(AP)	2				
77	10	21	14984	N24 W71	152	3400	3.5	19867	N19 W75	156	(AP)	3	B	10	1	AXX
77	10		14984					19874	N22 W66	147	(BY)	3	B	260	8	DAO
77	10	22	14984	N24 W84	150	3000	3.5	19874	N22 W79	146	(B)	2	B	60	2	HSO

REGIONS OF SOLAR ACTIVITY

OCTOBER 1977

MCMATH REGION 14999 CMP DATE 16.5

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
77	10	18	14999	N03 W27	147	200	2.0								
77	10	19	14999	N03 W41	146	100	1.5								

MCMATH REGION 15000 CMP DATE 17.1

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
77	10	14	15000	N40 E30	143	100	1.0								
77	10	16	15000	N40 E08	139	100	1.5								
77	10	17	15000	N40 W06	139	100	1.0								
77	10	18	15000	N40 W18	138	200	1.5								
77	10	19	15000	N40 W30	135	100	1.5								

MCMATH REGION 15001 CMP DATE 18.0

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
77	10	18	15001	N24 W08	128	200	2.5	19875	N22 W09	128	(AP)	1			
77	10	19	15001	N24 W22	127	200	2.0								
77	10	20	15001	N24 W35	128	200	2.0								

MCMATH REGION 14994 CMP DATE 19.1 RETURN OF REGION 14964 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
77	10	13	14994	S21 E71	115	400	2.0								
77	10	14	14994	S24 E57	116	200	1.5								
77	10	16	14994	S24 E33	114	400	1.5								
77	10	17	14994	S23 E20	113	600	1.0								
77	10	18	14994	S23 E07	113	400	1.0								
77	10	19	14994	S23 W07	112	300	1.0								
77	10	20	14994	S23 W20	113	300	1.0								
77	10	21	14994	S24 W34	115	100	1.0								
77	10	22	14994	S24 W46	112	200	1.0								

MCMATH REGION 14991 CMP DATE 19.5

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
77	10	12	14991	N23 E90	110	500	3.0								
77	10	13	14991	N24 E79	107	1500	3.5	19872	N23 E76	109	(BP)	4	B	310	2 DSO
77	10	14	14991	N23 E66	107	1400	3.5	19872	N23 E65	107	(B)	4	B	200	9 DSO
77	10	15	14991					19872	N23 E50	109	(B)	4	B	140	4 DSO
77	10	16	14991	N24 E40	107	1200	3.5	19872	N22 E37	109	(B)	4	B	90	7 DRO
77	10	17	14991	N24 E25	108	1300	3.5	19872	N23 E23	109	(AP)	3	B	90	8 CAO
77	10	18	14991	N24 E12	108	1200	3.5	19872	N24 E10	109	(AP)	4	B	40	3 HSX
77	10	19	14991	N24 W02	107	1300	3.0		N24 W03				B	20	5 AXX
77	10	20	14991	N24 W15	108	1000	3.0	19872	N24 W15	109	(AP)	2	H	20	4 AXX
77	10	21	14991	N24 W27	108	800	2.5								
77	10	22	14991	N24 W40	106	600	2.0								
77	10	24	14991	N24 W66	107	700	1.5								
77	10	25	14991	N25 W85	110	500	1.0								

MCMATH REGION 14995 CMP DATE 21.2 RETURN OF REGION 14952 ROTATION 3

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
77	10	14	14995	S25 E82	91	500	1.0								
77	10	16	14995	S25 E56	91	900	2.0								
77	10	17	14995	S26 E43	90	1000	2.0								
77	10	18	14995	S26 E31	89	2500	3.0	19876	S24 E36	83	(B)	3	B	20	6 BXO
77	10	19	14995	S26 E20	85	3100	4.0		S25 E23				B	240	20 DSI
77	10	20	14995	S26 E07	86	3300	4.5	19876	S25 E09	85	(B)	4	H	250	15 DAI
77	10	21	14995	S25 W06	87	3300	3.5	19876	S25 W03	84	(B)	4	B	300	18 ESO
77	10	22	14995	S25 W19	85	3000	3.0	19876	S25 W16	83	(B)	5	B	380	12 ESI
77	10	23	14995					19876	S25 W28	82	(BP)	4	B	240	11 ESI
77	10	24	14995	S25 W43	84	2100	3.5	19876	S24 W44	85	(BP)	4	H	210	4 CSO

Cont'd

REGIONS OF SOLAR ACTIVITY

OCTOBER 1977

MCMATH REGION 14995 (CONT) CMP DATE 21.2 RETURN OF REGION 14952 ROTATION 3

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	25	14995	S25 W60	85	1800	3.0	19876	S24 W58	85	(BP)	4	B	160	1	HSX
77	10	26	14995	S25 W70	85	2000	3.0	19876	S23 W71	85	(AP)	4	B	180	1	HSX
77	10	27	14995	S25 W83	83	1100	2.0									

MCMATH REGION 14996 CMP DATE 21.3 RETURN OF REGION 14951 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	16	14996	N28 E60	87	400	1.0									
77	10	17	14996	N30 E44	89	400	1.5									
77	10	18	14996	N29 E31	89	600	1.5									
77	10	19	14996	N30 E19	86	400	1.0									
77	10	20	14996	N30 E08	85	300	1.0									
77	10	21	14996	N30 W05	86	300	1.0									
77	10	22	14996	N30 W18	84	300	1.0									
77	10	24	14996	N30 W43	84	300	1.0									

MCMATH REGION 14997 CMP DATE 21.6

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	16	14997	N18 E68	79	600	2.0									
77	10	17	14997	N18 E52	81	600	2.0									
77	10	18	14997	N19 E40	80	700	2.5									
77	10	19	14997	N18 E26	79	400	2.0									
77	10	20	14997	N18 E12	81	300	1.5									
77	10	21	14997	N17 W02	83	200	1.5									
77	10	22	14997	N17 W15	81	200	1.0									
77	10	24	14997	N17 W41	82	300	1.0									

MCMATH REGION 14998 CMP DATE 23.4 RETURN OF REGION 14957 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	16	14998	N31 E85	62	500	1.0									
77	10	17	14998	N33 E75	58	1000	1.5									
77	10	18	14998	N33 E62	58	1000	1.5									
77	10	19	14998	N33 E49	56	600	1.0									
77	10	20	14998	N32 E36	57	600	1.0									
77	10	21	14998	N31 E24	57	500	1.0									
77	10	22	14998	N32 E11	55	500	1.0									
77	10	24	14998	N31 W15	56	600	1.5									
77	10	25	14998	N31 W30	55	500	1.5									
77	10	26	14998	N31 W40	55	400	1.0									
77	10	27	14998	N31 W52	52	400	1.0									
77	10	28	14998	N31 W65	53	400	1.0									
77	10	29	14998	N30 W78	52	200	1.0									

MCMATH REGION 15015 CMP DATE 24.7

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	26	15015	N19 W25	40	100	1.5									
77	10	27	15015	N19 W39	39	300	2.0									
77	10	28	15015	N19 W54	42	300	2.5	19883	N20 W56	44	(AP)	3	B	10	1	AXX
77	10	29	15015	N19 W69	43	300	2.5	19883	N20 W67	42	AP	1				
77	10	30	15015	N19 W82	45	300	1.5									

MCMATH REGION 15005 CMP DATE 24.8

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	20	15005	S26 E55	38	100	1.0									
77	10	21	15005	S27 E44	37	100	2.0		S27 E40				B	10	1	AXX
77	10	22	15005	S26 E31	35	300	2.5	19878	S26 E27	40	(AP)	2	B	10	1	AXX
77	10	23	15005					19878	S26 E14	40	(B)	3	B	20	4	BXO
77	10	24	15005	S26 E02	39	600	2.5	19878	S26 E03	38	(B)	3	H	10	1	AXX
77	10	25	15005	S26 W13	38	400	2.5									

Cont'd

REGIONS OF SOLAR ACTIVITY

OCTOBER 1977

MCMATH REGION 15005 (CONT) CMP DATE 24.8

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	26	15005	S26 W23	38	300	2.5									
77	10	27	15005	S26 W36	36	300	2.5									
77	10	28	15005	S26 W50	38	200	1.5									
77	10	29	15005	S26 W64	38	200	1.5									
77	10	30	15005	S26 W75	38	200	1.0									

MCMATH REGION 15004 CMP DATE 25.5

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	20	15004	N33 E65	28	200	1.0									
77	10	21	15004	N32 E51	30	200	1.0									
77	10	22	15004	N33 E38	28	100	1.0									

MCMATH REGION 15006 CMP DATE 28.5 RETURN OF REGION 14963 ROTATION 3

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	22	15006	N20 E84	343	700	2.0									
77	10	24	15006	N20 E51	351	1000	3.0	19879	N17 E52	350	(Y)	3	H	20	3	BXO
77	10	25	15006	N19 E35	351	900	2.5	19879	N17 E37	351	X	1				
77	10	26	15006	N19 E25	351	600	2.0									
77	10	27	15006	N19 E11	350	500	2.0									
77	10	28	15006	N19 W04	352	600	2.0									
77	10	29	15006	N19 W17	351	500	1.5									
77	10	30	15006	N19 W28	351	300	2.0									
77	10	31	15006	N19 W40	350	400	1.5									
77	11	01	15006	N19 W54		400	1.5									
77	11	02	15006	N19 W67		300	1.0									

MCMATH REGION 15011 CMP DATE 29.2

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	25	15011	S17 E43	343	100	2.0									
77	10	26	15011	S17 E33	343	100	2.0	19881	S17 E32	343	(B)	3	B	20	2	BRO
77	10	27	15011	S17 E20	341	200	2.0		S17 E21				B	0	1	AXX
77	10	28	15011	S17 E07	341	100	1.5									

MCMATH REGION 15018 CMP DATE 29.3

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	30	15018	S17 W17	340	300	1.5									
77	10	31	15018	S18 W35	345	600	2.5		S17 W27				B	60	3	CSO
77	11	01	15018	S19 W50		600	2.0	19886	S18 W50		(B)	4	B	50	5	C
77	11	02	15018	S19 W63		500	2.0									

MCMATH REGION 15009 CMP DATE 30.1

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	24	15009	N22 E73	329	500	3.5	19880	N22 E70	332	(B)	3	H	30	4	BXO
77	10	25	15009	N22 E58	328	800	3.0	19880	N22 E55	333	(B)	3	B	50	9	CRI
77	10	26	15009	N22 E46	330	2000	3.5	19880	N20 E45	330	(B)	3	B	50	10	DAI
77	10	27	15009	N22 E33	328	2000	3.0		N21 E32				B	70	12	CAO
77	10	28	15009	N23 E19	329	1800	3.0	19880	N22 E15	333	(Y)	3	B	50	6	BXI
77	10	29	15009	N23 E05	329	1500	2.5	19880	N21 E08	327	(B)	4	B	30	4	BXO
77	10	30	15009	N23 W07	330	1400	3.0	19880	N21 W05	327	(B)	3	B	40	9	CRO
77	10	31	15009	N23 W19	329	1500	2.5									
77	11	01	15009	N23 W32		1200	2.5									
77	11	02	15009	N23 W44		1300	2.5									
77	11	04	15009	N23 W72		1000	2.5									

REGIONS OF SOLAR ACTIVITY

OCTOBER 1977

MCMATH REGION 15008 CMP DATE 30.2 RETURN OF REGION 14967 ROTATION 2

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	24	15008	N31 E71	331	1100	2.5									
77	10	25	15008	N31 E55	331	1000	2.5									
77	10	26	15008	N31 E45	331	1100	2.5	19882	N31 E49	326	(B)	2	B	10	2	BXO
77	10	27	15008	N32 E33	328	1500	3.0		N31 E35				B	50	8	DRO
77	10	28	15008	N32 E19	329	1500	3.0	19882	N31 E20	328	(B)	4	B	40	4	BXO
77	10	29	15008	N32 E06	328	1300	2.5	19882	N31 E08	327	(B)	4	B	40	5	BXO
77	10	30	15008	N32 W05	328	1500	3.0	19882	N31 W08	330	(B)	4	B	20	5	BXO
77	10	31	15008	N32 W18	328	1600	2.5		N33 W21				B	40	7	BXI
77	11	01	15008	N32 W31		1200	2.5	19882	N30 W35		(AF)	4	B	20	2	A
77	11	02	15008	N31 W43		1100	2.5	19882	N30 W48		AF	1	B	10	1	A
77	11	04	15008	N32 W70		1000	3.0									

MCMATH REGION 15014 CMP DATE 30.7

			CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	10	25	15014	N14 E65	321	100	1.5									
77	10	26	15014	N14 E54	322	100	1.5									

DAILY CALCIUM PLAGE INDEX

OCTOBER 1977

DAILY CALCIUM PLAGE INDEX

YR	MO	DAY	INDEX	YR	MO	DAY	INDEX	YR	MO	DAY	INDEX
77	10	1	*	77	10	11	29.3	77	10	21	16.5
77	10	2	17.6	77	10	12	31.2	77	10	22	10.9
77	10	3	18.2	77	10	13	33.6	77	10	23	*
77	10	4	18.3	77	10	14	28.3	77	10	24	10.5
77	10	5	14.8	77	10	15	*	77	10	25	8.0
77	10	6	16.4	77	10	16	21.9	77	10	26	10.3
77	10	7	19.7	77	10	17	17.1	77	10	27	11.8
77	10	8	22.2	77	10	18	21.2	77	10	28	12.5
77	10	9	26.7	77	10	19	23.1	77	10	29	10.6
77	10	10	27.6	77	10	20	24.0	77	10	30	13.7
								77	10	31	15.4

* NO OBSERVATIONS

Note: No calcium spectroheliograms were secured at the McMath-Hulbert Observatory on October 1, 15 and 23, 1977.
No sunspot observations were made at Mt. Wilson on October 19, 27 and 31, 1977.

SUDDEN IONOSPHERIC DISTURBANCES

OCTOBER 1977

DAY	UNIVERSAL TIME START	END	MAX	IMP	WIDE SPREAD INDEX	NUMBER OF STATION REPORTS BY TYPE SWF	SCNA	SEA	SPA	LF-SPA	SES	SFD	KNOWN FLARE	McMATH REGION
02	2128	2157	2139	1-	3				1				2132E	14963
04	1835	1915	1840	1-	3				1		4		1823	14967
04	1950	2015	1-	3					1		4		NF	
05	1321	1410	1330	1+	5	3		5	3		4		1323E	14979
05	2242	2328	2248	1-	1	1							2242	14967
06	0027	0130	0036	1-	5			1	1		2	1	0027	14967
06	0249	0323	0300	1-	1	1							0248	14967
06	0427	0612	0438	2	5	1		1	2		1		0427	14967
06	0737	0953	0808	2	1				1				0739	X-RAY
06	0805	0900	0813	1+	5	3		1	2		2		0801	14979
06	1052	1230	1114	2	5	3		3	2		1		1055	14979
06	1420	1530	1430	1-	5	1		2	1		6		1420	14979
06	1605	1630	1608	1-	3						3		1605	14967
06	1949	2008	1952	1-	5	2		1	2		7		1946	14979
06	2345	2347	2346	1-	1							1	2345	14979
07	0419	0458	0430	1-	1				1				0414	14979
07	2212	2243	2222	1	5	1			2		5		2223E	14979
08	0232	0346	0255	1	3	1		1	1		1		0231	14979
08	1235	1400	1300	1-	5	1		1	1		1		1217	14979
08	2044E	2120	2050	1-	3						5		2044	14979
09	0445	0543	0455	1	1				1				0445	14979
09	1554	1700	1610	1	5	1			1		8		*	
12	0149	0338	0155	2	3	1			1				0155E	14979
13	0109	0154	0120	1-	1				1				0109	14979
13	2228	2304	2233	1-	1				1				2226	14979
14	0123	0224	0128	1-	1				1				0123	14979
14	0304	0344	0314	1-	1				1				0309	14979
19	2216	2337	2231	1-	1				1				2219E	14995
20	1547	1636	1610	1	1	1							1541	14995
22	0052	0133	0058	1-	1				1				0052	14984
22	0406	0545D	0416	1-	3	1			1				0403	X-RAY
22	0851	0915	0856	1+	3			1	3		1		0850	14984
22	1926	1955	1929	1-	5	2			2	1	6		*	
28	1902	1923	1905	1-	3				1	1	3		NF	
29	2010	2030	2014	1-	3			1			1	1	2009E	15016
30	1330	1350	1335	1-	1				1		1		1327	15017
31	0412	0446	0415	1-	1				1				0411	15017

PERIODS OF NO OBSERVATIONS:

DATE	TIME (UT) and STATION
01-20	0000-2400 A37
01-06	0000-2400 A28
11	0000-2400 TN, 0657-0820 TM
13	0700-1500 PU
14	0000-24 TN
17	0700-1300 PU
18	0000-2400 TN, 1503-2400 UM (18 kHz)
19	0700-1400 PU
22	1418-1554 TM, 1654-1722 TM
23-25	0000-2400 TN
26	1806-2234 TM
30-31	1842-1632 TM

STATIONS REPORTING FOR OCTOBER 1977

AAVSO (A1, A19, A21, A28, A30, A31, A35, A37, A40) (SES) (A1, A26, A31) (SEA) (A31) (SWF)
DARM STADT (DA) (SWF)
HAWAII (HA) (SFD)
HERSTMONCEUX (HC) (SEA)
HIRAISO (HI) (SWF)
HOBART (TA) (SEA, SES)
HUANCAYO (HU) (SWF)
INUBO (IN) (SPA)
KONA (KN) (SFD)
KUHLUNGSBORN (KU) (SWF, SEA, SPA)
MAUI (MU) (SFD)
MC MATH (MC) (SWF, SCNA)
NEW JERSEY (NJ) (SES)
PANSKA VES (PU) (SWF, SEA, SES)
PRESTON (LO) (SEA)
SAO PAULO (UM) (SES, SPA)
SOFIA (SF) (SES)
ST CLOUD (SC) (SES)
TABLE MOUNTAIN (TM) (SPA, LF-SPA)
TORINO (TN) (SPA)
UPICE (UI) (SEA)

SID's BY McMATH REGION

OCTOBER 1977

DAY / REGION	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
14963		1																													
14967					1	1	4																								
14979						1	5	2	3	1			1	2	2																
14984																						2									
14995																				1	1										
15016																													1		
15017																														1	1
X-RAY						1																1									
UNKNOWN				1																								1			
NO FF									1													1									

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

OCTOBER 1977

OCT 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
01	0000	0942	MANI										
	0556	1627	WEIS										
	0545	1650	DURN	1026.2	1026.3		1026.2	1026.3					III,N
	1044	2221	SGMR										
	1316	2245	HARV										
	2147	2400	MANI										
02	0000	0940	MANI										
	0548	1647	DURN	0548 E	1647 D	1	0548 E	1647 D	1				IC,DC,N
	0558	1342	WEIS										
			DURN	0844.7	0845.1	3	0844.7	0845.0	2				IIIG
			DURN	0849.8	0850.5	3	0850.1	0850.5	1				IIIG
			DURN	0852.8	0852.9								IIIG,N
			DURN	0858.3	0858.3	3							III
			DURN	1121.6	1121.6	2							III
	1355	1624	WEIS										
	1316	2245	HARV				2129	2130	2				IIIG
	1045	2219	SGMR							2139.0	2139.1	2	III
	2147	2400	MANI										
03	0000	0936	MANI										
	0550	1645	DURN	0550 E	1340	1	0550 E	1340	2				IC,DC,N
	0600	1622	WEIS										
			DURN				0607.1	0607.2	2				IIIG
			DURN	0740.5	0740.7	1	0740.5	0740.7	2				IIIG
			DURN	0744.5	0744.7		0744.5	0744.7					IIIG,N
	0857	1530	DWIN				0857	1530	1				IC
			DURN	0931.7	0931.7	2							III
	1047	2217	SGMR										
	1316	2245	HARV				1316	2141	1				IN
			HARV				1550		1	1550		1	IIIG,N
			HARV				1702		1	1702		1	IIIB,N
			HARV				1721		1	1721		1	IIIB,N
			HARV				1756		3	1756		3	IIIB
			HARV				1808	1818	1	1808	1818	1	IIIN,N
			HARV				1837		1				IIIB,N
			HARV				1904		2				IIIB
			HARV				1953		2				IIIB
	2146	2400	MANI										
04	0000	0936	MANI										
	0705	1406	WEIS										
	0757	1047	DWIN				0757	1047	1				IS
	1048	2216	SGMR										
	1230	1415	DWIN				1230	1415	1				IS
	1545	1639	WEIS										
	0553	1642	DURN	1550	1642 D	1	1550	1642 D	1				IC,N
	1316	2245	HARV				1605	1625	1	1605	1625	1	IIIN
			HARV				1706	1813	1	1706	1813	1	IIIN,N
			HARV				1835		2	1835		2	IIIB
			HARV				1846		1	1846		1	IIIB,N
	2146	2400	MANI										
05	0000	0936	MANI										
	0604	1640	DURN	0604 E	1640 D	2	0604 E	1640 D	3				IC,DC,N
	0600	1620	WEIS				0613.8	0613.9	2				IIIB
			DURN	0839.5	0840.1	3	0839.6	0839.6	1				IIIG
			WEIS				0848	1615	2				IIIN
			DURN	0933.1	0933.5	2	0933.1	0933.3	1				IIIG
	0945	1655	DWIN				0945	1655	1				IS
			DURN	0956.1	0956.4	1							IIIG
			WEIS				1034.5	1039.5	2				IIIG
			DWIN	1047.6	1048.4				2				IIIG
			DURN	1048.1	1048.4	3	1048.2	1048.3	3				IIIG
			DURN	1120.6	1121.0	3							IIIG
			DURN	1355.4	1355.9	2	1355.4	1358.1	3				IIIGG
			DWIN				1355.4	1358.0	2				IIIGG
			DURN	1414.8	1415.4	3							IIIG
			DWIN				1429.3	1429.5	2				IIIG
			WEIS				1429.4	1429.7	2				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS
OCTOBER 1977

OCT 1977	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
05	1049	2214	SGMR							1429.5	1430.8	2	IIIG
	1316	2245	HARV				1429	1430	3	1429	1430	3	IIIG,V
			DURN	1605.3	1606.8	3	1605.5	1606.8	3				IIIGG
			DWIN				1605.5	1606.1	3				IIIG
			DURN	1607.8	1608.0	1	1607.9	1608.0	1				IIIG
			DWIN				1609.5	1609.8	2				IIIG
			DURN				1609.6	1609.8	1				IIIG
			HARV				1612	1720	1	1612	1720	1	I
			DURN				1613.7	1615.3	3				IIIG
			DWIN				1613.7	1615.0	2				IIIG
			DWIN				1624.4	1624.5	2				IIIG
			DURN				1624.4	1624.5	3				IIIG
			DURN				1625.7	1625.7	2				III
			DWIN				1653.3	1653.4	2				IIIG
			HARV				1729		3	1729		3	IIIB
			HARV				1800	1805	3	1800	1805	3	IIIG,V
			HARV				1804		3				UNCL
			HARV				1811		3	1811		3	IIIG,V
			HARV				1834		1	1834		1	IIIG,W
			HARV				1841		1	1841		1	IIIG,W
			HARV				1933		2	1933		2	IIIB
			HARV				1943	1944	2	1943	1944	2	IIIG
			HARV				1952		1	1952		1	IIIB
06	0035	0935	MANI										
	0557	1638	DURN	0557 E	1638		0557 E	1638					IN,N
	0745	1519	DWIN				0745	1519	1				IS
			DWIN				0803.5	0804.2	2				IIIG
			DURN	0803.6	0804.3	1	0803.6	0804.3	2				IIIG
			DWIN				0939.9	0940.1	2				IIIG
	0603	1440	WEIS				0939.9	0940.4	2				IIIG
			WEIS				0952.0	0953.0	2				IIIG
			WEIS				1020.5	1020.7	1				IIIG
			DWIN				1020.6	1021.0	2				IIIG
			DWIN				1021.9		1				IIIB
			WEIS				1022.2	1023.3	3				IIIG
			DWIN				1110.0	1110.4	2				IIIG
			DWIN				1122.2	1122.6	3				IIIG
			DURN				1122.2	1123.4	3				IIIG
			WEIS				1124.7	1125.2	1				IIIG
			WEIS				1143.3	1146.7	2				IIIGG
			WEIS				1150.0	1150.8	1				IIIG
			DURN				1204.5	1204.6	1				IIIG
			DWIN				1204.5	1204.6	2				IIIG
			WEIS				1205.7	1205.8	1				IIIB
			DWIN				1223.3	1223.4	2				IIIG
			WEIS				1224.3	1224.8	1				IIIG
	1050	2212	SGMR							1224.4	1301.1	1	IIIG
			WEIS				1231.0	1231.7	3				IIIG
			DWIN				1231.2	1231.6	2				IIIG
			DWIN				1238.5	1238.7	1				IIIG
			SGMR							1301.1	2212.0	1	CONT
	0745	1519	DWIN				1309.8		2				IIIB
			DURN	1309.8	1309.8		1309.8	1309.8					IIIW
			DWIN				1311.3	1311.8	2				IIIG
			DWIN				1332.7		2				IIIB
			DURN				1332.7	1332.7	1				III
	1316	2245	HARV				1332	1333	1	1332		1	IIIG
			WEIS				1345.2	1345.7	2				IIIG
			DWIN				1349.0		2				IIIB
			HARV				1432	1434	1	1432	1434	1	IIIG,W
			DWIN				1434.9	1435.1	2				IIIG
			WEIS				1434.9	1435.2	1				IIIG
			HARV				1435	1436	3	1435	1436	3	IIIG
			HARV				1439	1440	2	1439	1440	2	IIIG
			DURN	1523.0	1523.3	3	1523.0	1523.1	2				IIIG
			DURN	1550.9	1551.5	3	1550.9	1551.5	2				IIIG
	1502	1605	WEIS				1550.9	1551.4	3				IIIG
			HARV				1551	1552	3	1551	1552	3	IIIGG
			DURN	1604.5	1605.6	3	1604.5	1605.6	3				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

OCTOBER 1977

OCT 1977	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
06			WEIS				1604.6	1605.4	1				IIIG
			HARV				1605	1607	1	1605	1607	1	IIIG
			HARV				1610		2				I
			HARV				1619		3	1619		3	IIIB
			HARV				1658		2	1658		2	IIIB
			HARV				1830	1833	3	1830	1833	3	IIIG
	2146	2400	MANI										
07	0000	0933	MANI										
	0604	1145	WEIS				0617.8	0617.9	1				IIIB
	0559	1637	DURN				0811.3	0811.5	2				IIIG
	0850	1440	DWIN				0850	1440	1				IS
			DURN	1100.1	1100.2	3							IIIG
			DURN	1129.9	1134.8	3	1129.9	1134.8	3				IIIGG,RS,U
			DWIN				1129.9	1130.5	2				IIIG
			DURN	1130	1637	2	1130	1637	2				IC,DC,N
			DWIN				1134.4	1434.6	2				IIIG
			DWIN				1250	1440	1				IC
	1051	2210	SGMR							1303.2	1303.4	1	III
			SGMR							1345.1	2210.0	1	CONT
			DURN	1432.9	1433.7	2							IIIG
	1316	2245	HARV				1537	1730	2				IN
			HARV				1715	1737	1	1715	1737	1	IIIN
			HARV				1730	2245	3				IC
			HARV				1737	2027	3	1737	2027	3	IIIS
	2146	2400	MANI										
08	0000	0933	MANI										
	0601	1635	DURN	0601 E	1635 D	2	0601 E	1635 D	2				IC,DC,N
	0619	1613	WEIS				0621.0	1639	3				I
			WEIS				0622.6	0623.4	2				IIIG
			DURN				0853.9	0854.3	3				IIIG
			DURN	1043.6	1043.6	1	1043.6	1043.6	1				III
			DURN	1231.1	1236.6	2							DCIM
			DURN	1243.9	1245.0	1							DCIM
			WEIS				1244.2	1244.8	1				IIIG
	1052	2209	SGMR							1244.4	2209.0	1	CONT
	1316	2245	HARV				1330	1500	1				I,W
			DURN	1417.1	1417.2								IIIW
			HARV				1417	1418	3	1417	1418	3	IIIG,V
			HARV				1500	2200	2				I
			HARV				1552	1554	3	1552	1554	3	IIIGG
			WEIS				1553.2	1553.7	3				IIIG
			HARV				1738	1817	1	1738	1817	1	IIIN
			HARV				1823	1824	3	1823	1824	3	IIIB,V
			HARV				1832	2019	2	1832	2019	2	IIIN
			HARV				2032		3	2032		3	IIIG,V
			HARV				2034	2035	3				IIIGG
			HARV				2037		2	2037		2	IIIG
			HARV				2056	2057	3	2056	2057	3	IIIG
	2146	2400	MANI										
			HARV				2208	2209	2				IIIG
			HARV				2220	2221	1				IIIG
			HARV				2237		3	2237		3	IIIB
			HARV				2240	2241	3	2240	2241	3	IIIG
09	0000	0930	MANI										
	0602	1633	DURN	0610.4	0614								IIIW,N
	0608	0823	WEIS				0615.6	0615.8	1				IIIB
			WEIS				0708.9	0709.6	2				IIIG
			WEIS				0742.4	0744.0	1				IIIG
			WEIS				0757.4	0757.6	1				IIIG
			DURN	0922.3	0922.6	3	0922.4	0922.6	3				IIIG
	1053	2207	SGMR										
	1050	1642	WEIS				1056.0	1056.2	3				IIIB
			WEIS				1139.2	1140.3	2				IIIG
	1316	2245	HARV				1714	2203	1	1714	2203	1	IIIN,W
	2146	2400	MANI										
10	0000	0538	MANI										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

OCTOBER 1977

OCT 1977	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS: DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
10	0553	0930	MANI										
	0603	1630	DURN										
	0607	1600	WEIS				0617.8	1230.0	1				I
	1055	2205	SGMR										
	1331	2245	HARV										
	2146	2400	MANI										
11	0000	0933	MANI							0027.5	0041.7	2	CONT
			MANI							0049.0	0118.1	2	CONT
			MANI							0121.2	0303.0	2	CONT
	0611	0956	WEIS										
	0604	1628	DURN	0730.1	0738.2	1							III
	0832	1345	OWIN				0914.5	0914.6	1				IIIG
	1056	2204	SGMR										
			DURN	1107.2	1107.6	3	1107.3	1107.5	3				IIIG
			OWIN				1107.3	1107.4	2				IIIG
	1037	1608	WEIS	1137.1	1137.2	1							IIIG
	1332	2245	HARV				1758		1				IIIB
			HARV				2107	2108	1				IIIG,N
	2158	2400	MANI							2258.2	2259.1	2	IIIG
			MANI							2302.5	2302.8	2	III
12	0000	0931	MANI							0028.0	0028.7	1	III
			MANI							0036.9	0040.1	2	IIIG
			MANI							0045.8	0106.0	2	CONT
			MANI							0118.9	0131.3	2	CONT
			MANI							0150.4	0203.4	3	IIIG
			MANI							0250.2	0251.0	1	III
			MANI							0327.0	0348.8	2	CONT
	0611	1512	WEIS				0834.4	0835.1	1				IIIG
			WEIS				1247.5	1249.1	2				IIIG
	1057	2202	SGMR							1248.4	1248.5	1	III
			WEIS				1251.0	1251.2	1				IIIB
	0605	1626	DURN	1511.9	1512.3	3	1511.9	1512.3	3				IIIG
			WEIS				1512.0	1512.2	1				IIIG
	1332	2245	HARV				1715	1857	1	1715	1857	1	IIIN,W
			HARV				2047	2154	1	2047	2154	1	IIIN
	2147	2400	MANI										
13	0000	0939	MANI							0008.4	0008.7	1	III
			MANI							0021.5	0339.0	2	CONT
	0606	1625	DURN	0643.5	0644.8	2	0643.3	0644.8	2				IIIG
			DURN				0709.1	0709.3	1				IIIG
			DURN				0717.4	0717.4	1				III
	0613	0945	WEIS				0726.6	0728	3				IIIG
			DURN	0746.7	0747.8	2	0746.2	0747.8	3				IIIG
	0952	1604	WEIS										
	1058	2200	SGMR										
	1332	2245	HARV				1714	2245	1	1714	2245	1	I,IIIN,W
	2146	2400	MANI										
14	0000	0939	MANI							0028.5	0036.0	2	CONT
			MANI							0044.3	0045.2	2	III
			MANI							0051.3	0403.0	2	CONT
	0608	1624	DURN										
	0614	1603	WEIS										
	1059	2159	SGMR										
	1332	2245	HARV				1525	1643	1	1525	1643	1	IIIN
			HARV				1646	2223	2	1646	2223	2	IIIS
	2147	2400	MANI							2351.3	0052.2	2	III
15	0000	0928	MANI							0003.0	0020.4	2	CONT
			MANI							0025.5	0430.0	2	CONT
	0610	1622	DURN										
	0616	0951	WEIS										
	1040	1600	WEIS										
	1100	2157	SGMR										
	1332	2245	HARV				1546	2100	1	1546	2100	1	IIIS
			HARV				2035	2041	2				I
	2146	2400	MANI										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

OCTOBER 1977

OCT 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
16	0000	0928	MANI										
	0610	1620	DURN				0610 E	1620	3				IC,DC,N
	0616	1548	WEIS										
			DURN	1121.5	1121.9	2							IIIG
	1102	2155	SGMR							1150.0	2155.0	1	CONT
	1332	2245	HARV				1332	2245	1				I
			HARV				1420	2100	2	1420	2100	2	IIIS
			DURN				1513	1515	1				IC,N
			DURN				1614.4	1614.5	1				IIIG
	2146	2400	MANI										
17	0000	0925	MANI							0026.7	0223.1	2	CONT
	0611	1618	DURN				0610 E	1618	1				IC,DC,N
	0620	1156	WEIS				0740.0	1138.0	1				IN
	1103	2154	SGMR							1103.0	2154.0	1	CONT
	1136	1248	DWIN				1136	1248	1				IC
	1200	1556	WEIS										
	1332	2245	HARV				1332	2245	1				I,W
			HARV				1519	1548	1	1519	1548	1	IIIN,W
			HARV				1552	2240	2	1552	2240	2	IIIS
	2147	2400	MANI										
18	0000	0923	MANI							0018.9	0138.7	2	CONT
	0612	1616	DURN										
	0621	1558	WEIS										
	0830	1540	DWIN				0830	1540	1				IC
	1104	2152	SGMR										
			DWIN				1131.9	1132.0	1				IIIG
			DWIN				1218.7	1219.8	1				IIIG
			DWIN				1252.5	1252.6	2				IIIG
	1332	2245	HARV				1752	1756	2	1752	1756	2	IIIG
			HARV				2028		2	2028		2	IIIB
			HARV				2117		1	2117		1	IIIB
			HARV				2121		1	2121		1	IIIB
			HARV				2130		1				IIIB
	2147	2400	MANI										
19	0000	0923	MANI										
	0613	0853	DURN										
	0942	1646	DWIN				0942	1646	1				IS
			DWIN				0951.2	0953.2	2				IIIG
	0621	1238	WEIS				0951.8	0954.5	2				IIIG
	1105	2151	SGMR										
			WEIS				1111.0	1114.0	1				IIIG
	1017	1614	DURN				1203	1231	1				IC,N
	1332	2245	HARV										
	2147	2400	MANI										
20	0000	0920	MANI										
	0614	1610	DURN				0614 E	1030	2				IC,DC,N
	0624	1550	WEIS										
			DURN				0725.6	0725.7	3				III
	0805	1255	DWIN				0805	1255	1				IS
	1106	2149	SGMR							1710.6	1711.0	1	III
	1332	2245	HARV				1711		3	1711		3	IIIB
			HARV				1728		2	1728		2	IIIB
			HARV				1815	1819	2	1815	1819	2	IIIG
			HARV				1851		1	1851		1	IIIG,W
			HARV				1857		2	1857		2	IIIG
			HARV				2030	2240	1				IN,W
	2149	2400	MANI										
21	0000	0920	MANI										
			DURN				0725.8	0725.9	1				IIIG
	0822	1133	DWIN				0822	1133	1				IS
	0626	1432	WEIS				0843.5	0843.6	2				IIIG
			DWIN				0936.0	0936.2	2				IIIG
			DURN	0936.1	0936.1	1	0936.1	0936.1	3				IIIG
	0615	1608	DURN	1040	1608	1	0615 E	1608	2				IC,DC,N
	1332	2245	HARV				1332	2245	1				IN,W

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

OCTOBER 1977

OCT 1977	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
21	1351	1557	OWIN				1351	1557	1				IS
			HARV				1619		1	1619		1	IIIG
			HARV				1637	1757	1	1637	1757	1	IIIN
	1108	2148	SGMR							1711.8	1712.1	3	V
			HARV	1712		3	1712		3	1712		3	IIIG,V
			HARV				1740	1743	3	1740	1743	3	IIIG
			SGMR							1741.6	1741.7	1	III
			SGMR							1814.8	1815.0	2	III
			HARV				1815		3	1815		3	IIIG
			HARV				1825		1	1825		1	IIIB
	2149	2400	MANI										
22	0000	0920	MANI										
	0616	1605	DURN				0616 E	1605					IC,DC,N
	0958	1625	OWIN				0958	1625	2				IC,S
			DURN	1012.7	1013.4	2	1012.7	1013.4	3				IIIG
			OWIN				1012.8	1013.5	2				IIIG
	1107	1546	WEIS										
	1109	2146	SGMR										
	1332	2245	HARV				1332	1420	2				I
			HARV				1618	2200	1				I,W
	2149	2400	MANI										
23	0000	0917	MANI										
	0617	1604	DURN				0617 E	1200					IC,DC,W,N
	0629	1544	WEIS										
	0911	1600	OWIN				0911	1600	1				IS
			OWIN				1142.0	1144.5	2				IIIG
			OWIN				1149.3	1149.4	2				IIIG
	1110	2145	SGMR							1711.3	1712.0	1	V
	1332	2245	HARV				1711	1712	3	1711	1712	3	IIIG,V
	2149	2400	MANI										
24	0000	0917	MANI										
	0618	1603	DURN										
	0631	1205	WEIS										
	1111	2143	SGMR										
	1436	1543	WEIS										
	1332	2245	HARV				1955		1	1955		1	IIIB
	2149	2335	MANI										
25	0244	1015	MANI										
	0620	1602	DURN				0620 E	1200	1				IC,DC,N
	0630	1542	WEIS										
	1113	2142	SGMR										
	1332	2245	HARV				1332	1333	1				I
			HARV				1709		2	1709		2	IIIG
	2149	2400	MANI										
26	0000	0032	MANI										
	0045	0648	MANI										
	0621	1600	DURN										
	0633	1443	WEIS										
	0707	0915	MANI										
	1114	2140	SGMR										
	1332	2245	HARV										
	2149	2400	MANI										
27	0000	0915	MANI										
	0621	1559	DURN										
	1115	2139	SGMR										
	1332	2245	HARV										
	2150	2400	MANI										
28	0000	0914	MANI										
	1116	2137	SGMR										
	0928	1510	WEIS				1210.0	1210.4	1				IIIG
			WEIS				1218.4	1218.5	1				IIIG
	0622	1555	DURN	1218.5	1218.6	3	1218.4	1218.5	1				IIIG
			DURN				1226.7	1226.7	1				III

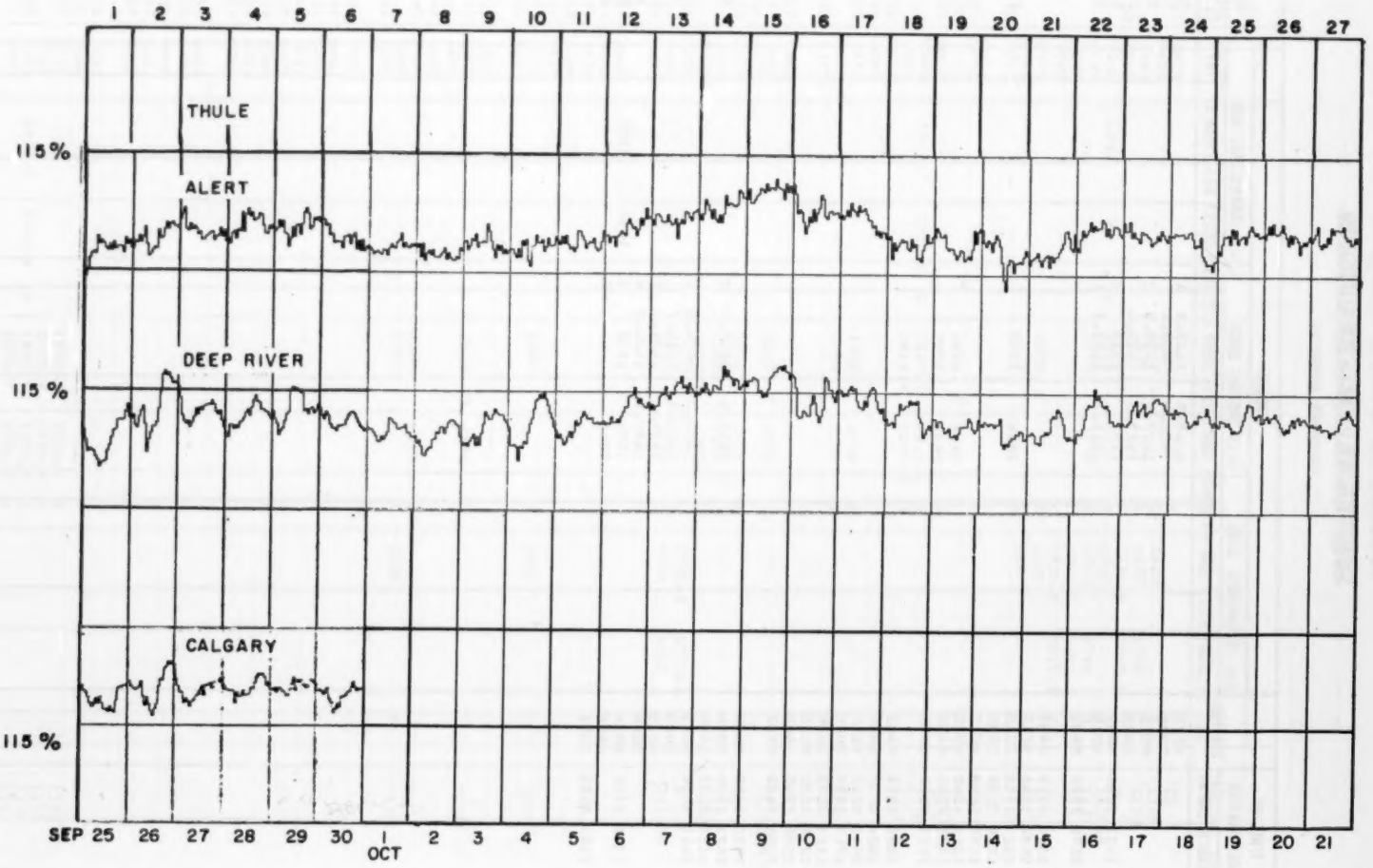
SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

OCTOBER 1977

OCT 1977	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
28			WEIS				1226.8	1229.0	1				IIIG,RS
			DURN				1420.4	1420.4					III,W
			WEIS				1427.0	1429.0	2				IIIG
			DURN				1427.1	1428.6					IIIG,W
	1332	2245	HARV				1427	1428	2				IIIG
			WEIS				1510.0	1510.8	1				IIIG
	2150	2400	MANI										
29	0000	0910	MANI										
	0637	1140	WEIS										
	0623	1558	DURN				0810	1300					IC,W,N
	1118	2136	SGMR										
	1155	1259	WEIS										
	1314	1540	WEIS										
	1332	2245	HARV										
	2150	2400	MANI										
30	0000	0910	MANI										
	0624	0711	DURN										
	0641	1212	WEIS										
	0719	1557	DURN										
	1119	2135	SGMR										
	1242	1530	WEIS										
	1332	2345	HARV										
	2151	2400	MANI										
31	0000	0910	MANI										
	0628	1556	DURN				0644.1	0645.5	1				IIIG
	1120	2133	SGMR										
	0640	1424	WEIS				1414.2	1414.6	1				IIIG
			DURN				1414.7	1414.7					III,W
			WEIS				1424.1	1424.3	2				IIIB,U
			DURN				1424.2	1424.3	1				IIIG,RS
	1332	2345	HARV				1554	1555	3	1554	1555	3	IIIG
			HARV				2045		2				IIIG
	2152	2400	MANI										

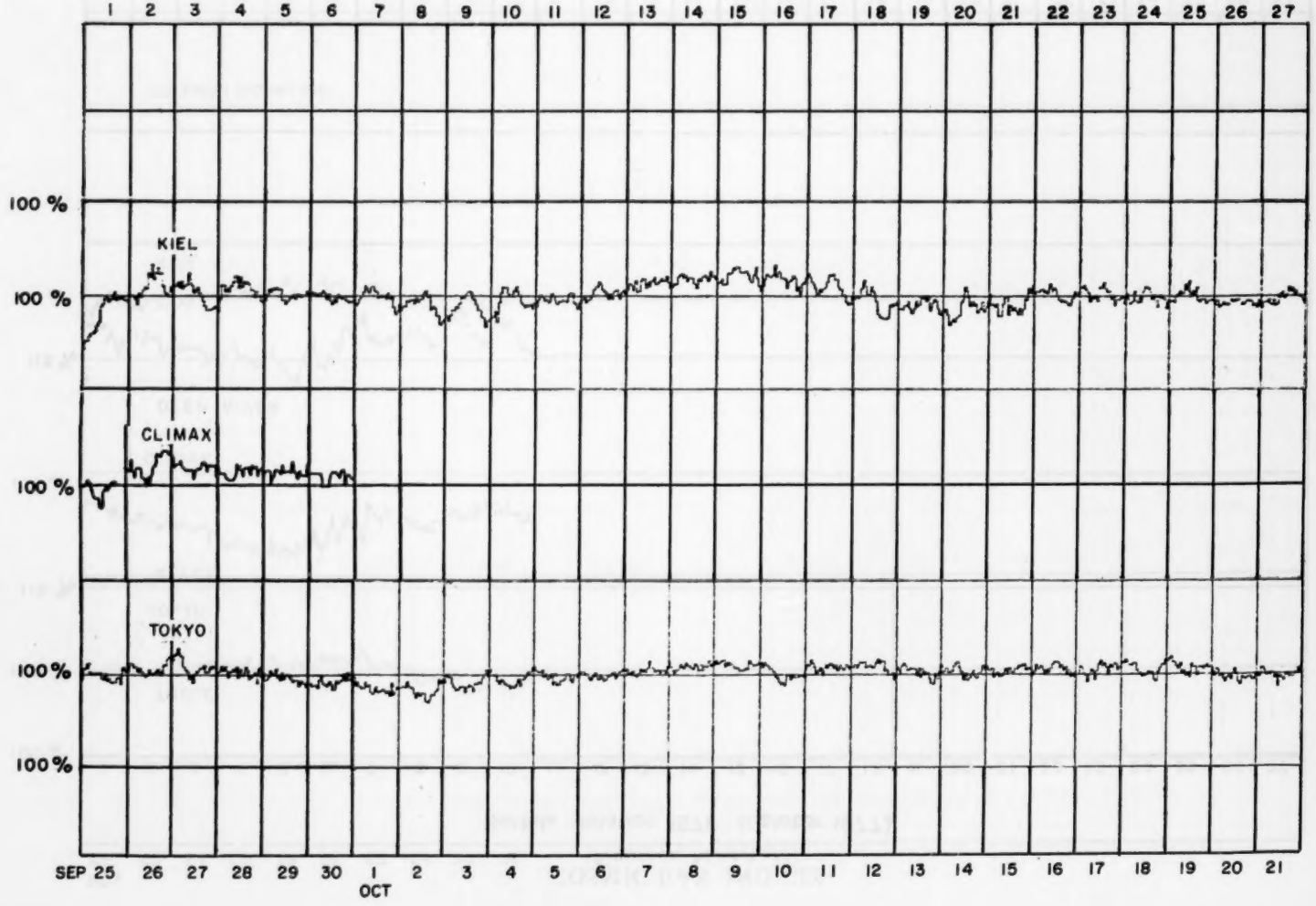
COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1971 (September - October 1977)



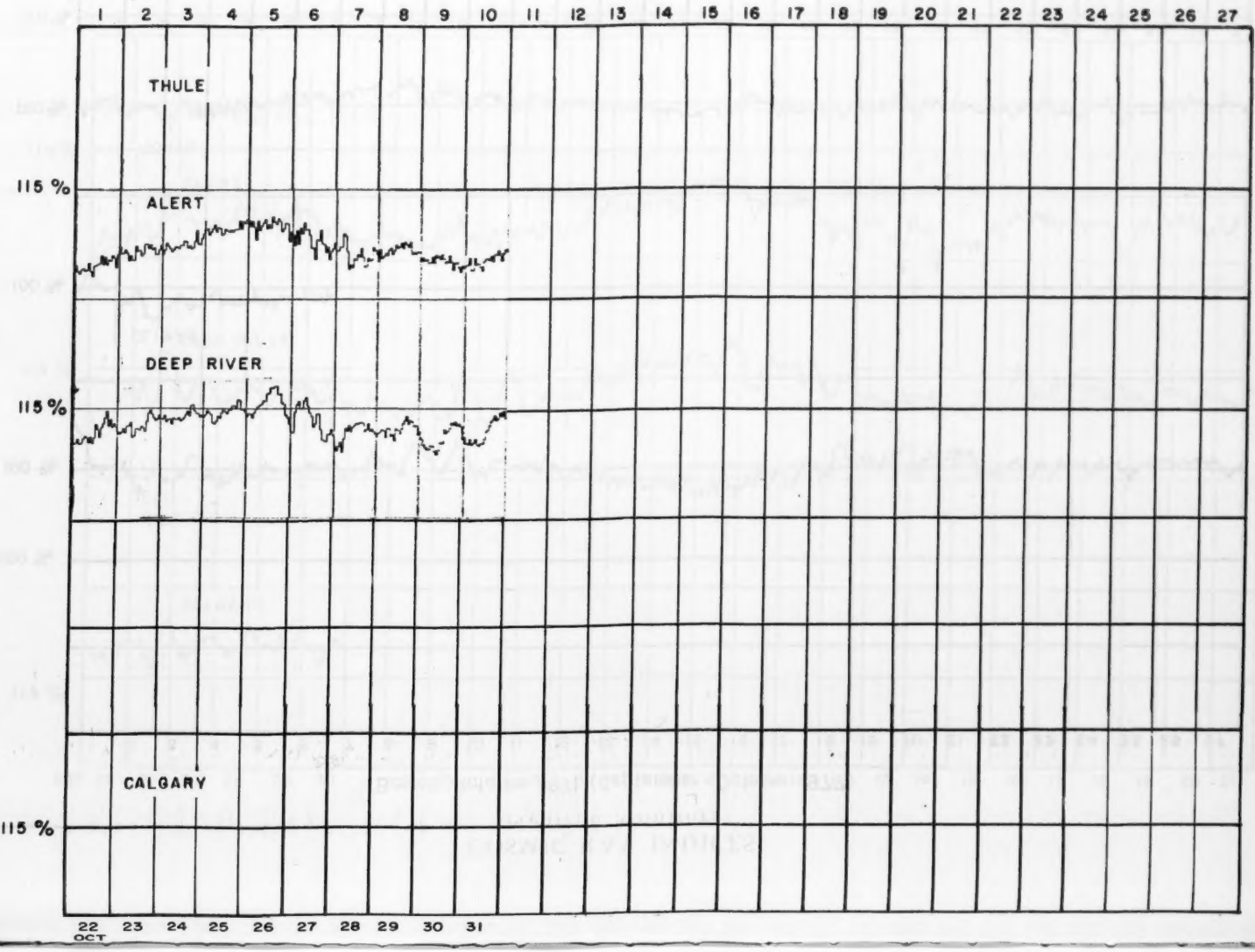
COSMIC RAY INDICES
(Neutron Monitors)

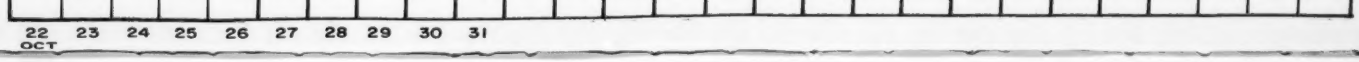
Bartels Rotation 1971 (September - October 1977)



COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1972 (October 1977)

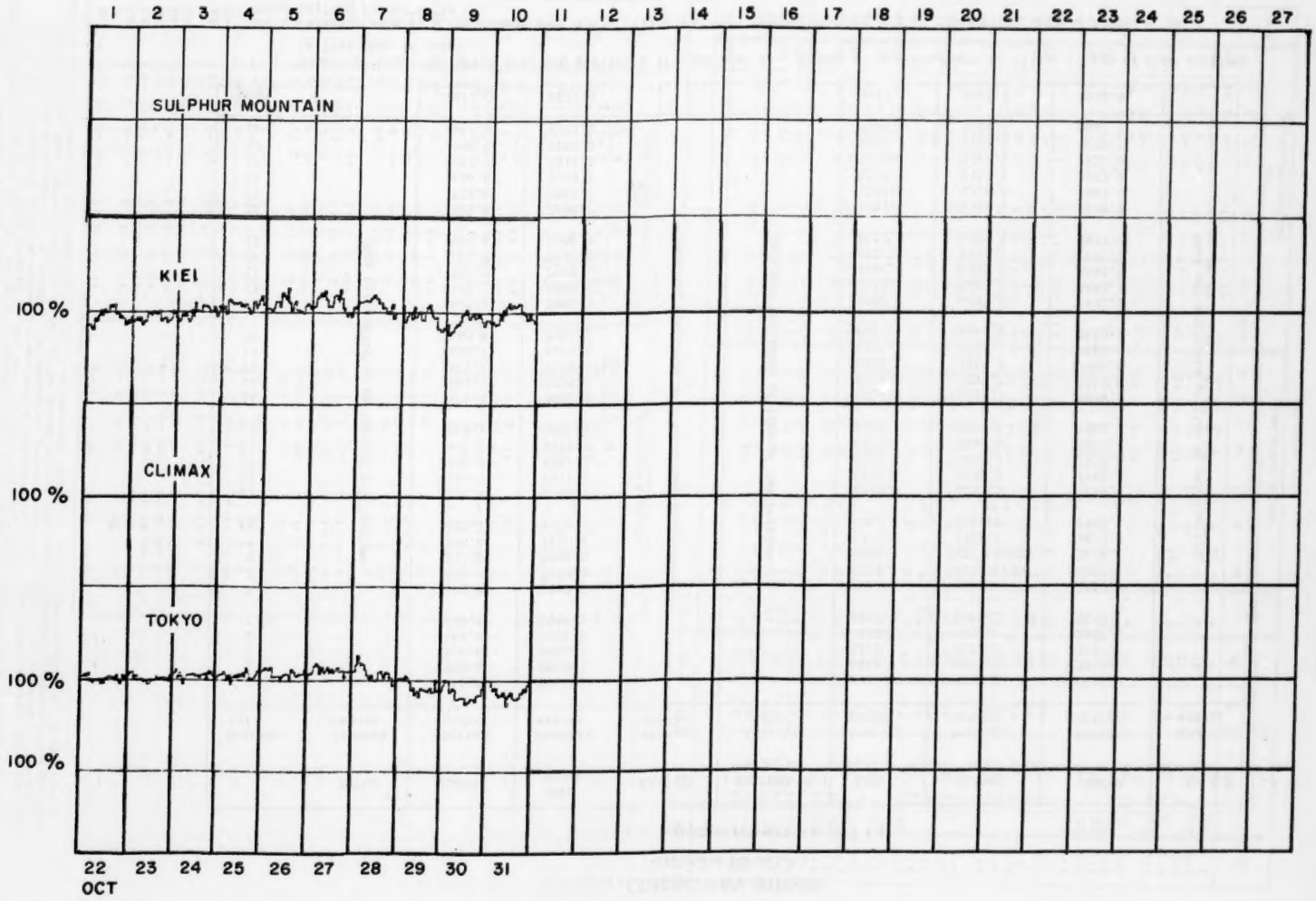




COSMIC RAY INDICES

(Neutron Monitors)

Bartels Rotation 1972 (October 1977)



COSMIC RAY INDICES

(Neutron Monitors)

OCTOBER 1977

October 1977	THULE Average cts/hr	ALERT Average cts/hr	DEEP RIVER Average cts/hr	CALGARY Average cts/hr	SULPHUR MT Average cts/hr	KIEL Average cts/hr	CLIMAX Average cts/hr	TOKYO Average cts/hr	KULA Average cts/hr
1		7415.5	6971.3			6305.9	4205.1	3626.9	
2		7398.4	6960.3			6278.0	4184.0	3622.6	
3		7426.6	6981.3			6271.3	4197.3	3637.6	
4		7419.4	6991.3			6294.7	4201.4	3645.1	
5		7433.9	6984.1			6297.2	4205.3	3651.1	
6		7471.8	7029.7			6319.0	4223.4	3654.0	
7		7500.7	7073.0			6352.8	4243.9(30)	3662.4	
8		7533.3	7096.5			6368.6	4293.8(12)	3670.3	
9		7580.4	7110.1			6377.2	4289.5	3672.9	
10		7521.7	7053.8			6366.3	4246.4	3654.3	
11		7502.4	7062.1			6338.9	4253.5	3668.8	
12		7429.3	7017.5			6292.1	4238.2	3669.5	
13		7430.9	6988.1			6279.8	4206.6	3659.0	
14		7404.1	6977.0			6270.1	4197.8	3660.4	
15		7411.3	6981.1			6281.8	4203.6	3662.8	
16		7471.5	7022.3			6314.0	4223.5	3664.3	
17		7461.3	7035.3			6315.8	4237.7	3663.8	
18		7433.2	7018.3(33)			6305.5	4243.0	3664.8	
19		7458.7	7009.6			6311.1	4258.6	3668.3	
20		7460.8	7006.7			6287.5	4246.4	3650.5	
21		7460.5	7000.3			6304.0	4252.2	3652.9	
22		7450.1	7008.6			6310.3	4263.3	3665.1	
23		7491.0	7028.1			6308.2	4255.2	3665.9	
24		7510.5	7053.8			6327.5	4271.7	3672.3	
25		7560.6	7066.5			6352.2	4269.3	3673.0	
26		7569.9	7090.0			6353.2	4284.2	3677.5	
27		7522.4	7041.7			6359.6	4310.6	3682.0	
28		7480.6	7009.2			6349.7	4312.7	3677.2	
29		7495.0	7017.6			6312.2	4264.7	3652.0	
30		7460.5	6994.6			6301.3	4253.2	3638.2	
31		7465.4	7012.1			6324.1	4262.7	3641.3	
MEAN		7472.0	7022.3			6317.1	4243.6	3658.9	

Data not available at time of publication. (THULE)
Data not available at time of publication. (CALGARY)
Data not available at time of publication. (SULPHUR MT)
Data not available at time of publication. (KULA)

( ) Number of hours for which data are available if less than 24. Number of Section Hours at Climax if sum of both sections is less than 40 hours.

Thule, Alert, Calgary, Sulphur Mountain, Kiel, Climax and Kula Scaling Factors = 100. Deep River Scaling Factor = 300. Tokyo Scaling Factor = 256.

Kula data are available on magnetic tape from the World Data Center A for Solar-Terrestrial Physics. These data include the periods July 1967 - December 1970 and October 1975 to the present.

Note: Tokyo neutron monitor counting rate increased by 2.0/1.5 since the beginning of September 1977. The number of counters changed from 27 to 36. Since the scaling factor has been changed, the listed figures are nearly the same as those in and before May 1977. The level in June, July, and August, 1977 is slightly lower than before. The level in September 1977 has been adjusted, so that direct comparison with the data in and before May, 1977 is possible.

GEOMAGNETIC ACTIVITY INDICES

OCTOBER 1977

Day	Three-Hourly Indices Kp									Three-Hourly Indices Km								Ap	aa *					Cp
		1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8		N	S	M			
1	Q3	0+	1+	1-	1	1+	1-	1-	1+	7+	1-	1-	1-	1	1	1	0+	1+	4	9	5	5	9	CC	0.1
2	Q6	2	1+	2-	2+	2-	0+	0+	1-	10+	2-	2-	2	3-	2-	0	0+	1	5	10	9	14	5	CK	0.2
3		0+	2	3	2+	4-	3-	2	1-	17-	1	2	3-	3	3	3-	2	1	10	21	19	16	24		0.5
4		3-	2+	2+	2-	2	1-	1+	2	15	3-	2+	2+	1+	2-	1	1+	2	7	17	9	14	13	C	0.4
5		2+	1+	2+	2+	3-	2+	2	1	16+	2	1+	2	2	2+	3-	2-	1	8	17	8	13	12	CC	0.4
6		3	2+	3-	1+	2-	2	2	2-	17-	2+	2	3-	1+	2	2+	2-	1+	8	17	11	15	13	C	0.5
7	Q2	0+	0+	1-	2-	1	0+	1-	1-	6-	1	1-	1+	2	1-	0+	0+	1-	3	11	6	6	11	CC	0.1
8		1-	2-	1	1+	2	2-	3-	1	12	1-	1+	1	1+	2	2-	2+	1	6	7	7	8	7	CC	0.3
9	Q1	0+	0+	0	0+	1	1-	0+	1-	4-	1-	1-	0+	0+	1	0+	1	1	2	5	4	5	5	CC	0.0
10	Q5	0	0	0	3-	1+	1-	1+	2	8	0+	0	0+	3-	1+	1	2-	2	4	11	6	8	9	CC	0.1
11		3-	2-	2	1	2-	2+	3	5-	19	2-	1+	2	1+	2-	2+	3	4	12	30	14	14	32		0.7
12	03	4	5	5-	5	4	3+	3-	2-	30+	3+	4-	4+	5-	3+	3	2+	2	28	40	42	58	24		1.2
13		2-	4	3+	3-	4	1+	2+	3-	22	2-	4-	2+	2+	4	1+	2+	2+	14	30	24	23	32		0.8
14		2-	0	0+	4	3-	2+	3-	5-	18+	1+	0+	0+	4-	2+	2	3	4-	13	29	14	12	31		0.8
15		4+	2+	5-	4+	2-	2-	3	3-	25-	4-	2	4	4-	2+	2	3	3-	19	36	19	34	21		1.0
16		2+	3	1	1	2	2-	2-	2+	15	2+	2+	1	1-	2	2	2-	3-	8	15	9	9	15	C	0.4
17		2+	3	2+	2	2+	3+	3-	3+	21+	2	2+	2	2	2	3	2+	3	12	27	11	15	23		0.7
18		3+	3+	4-	3-	2+	3	4+	5	28-	3-	3-	3-	3-	3-	3	4	4+	22	34	21	20	36		1.1
19	04	6	5	4+	3+	3+	3+	2+	0+	28	5-	4	4-	4-	4-	3	2+	0+	28	38	41	62	17		1.2
20		0	1+	1+	2	2+	3	1+	2+	14-	0	1-	1	2	2+	3-	1+	2	7	14	10	7	18	KK	0.3
21	Q7	3-	0+	1	1	1-	1+	1+	2	10+	2	0+	1-	1-	1	1+	1+	2-	5	10	7	10	8	C	0.2
22	05	4-	4	5	3	3	3+	3-	4-	28+	3	3-	4	3-	3	3	2+	3	22	41	28	34	28		1.1
23		3-	3-	2-	1-	0	0+	2	2-	12-	2+	2	2-	1	0+	0+	2	2-	6	11	7	12	7	C	0.3
24	Q0	2+	2	1+	1+	1+	1	1+	2-	12+	2-	1+	1	2-	2-	1	1+	2-	6	12	11	13	11	CC	0.3
25	Q4	2-	0+	1-	0+	0	1+	2	2	8+	1+	1	1-	0+	0+	1+	2	2	4	8	7	6	10	CC	0.1
26	Q9K	1-	2+	2-	1	0+	1-	1	3	11-	1+	2	2-	1+	1	1+	1	3	6	11	12	11	12	C	0.3
27	01	4	3+	3+	6+	6-	5	7-	7-	41	4-	3-	3+	5+	5+	5	6-	6-	62	73	66	51	87		1.7
28	02	6	7+	5+	3-	3+	3+	4+	2	34+	5	6	4+	3-	3+	3+	4-	2-	47	63	44	72	35		1.5
29		2+	2	1	3-	4-	2+	1	2-	17-	2	2-	1	2	4-	3-	1+	2-	9	15	16	13	18		0.5
30		1+	1	2-	2	2+	4	2	2-	16	1+	1	2-	2-	2	4-	2	1+	9	15	12	8	20		0.5
31	Q8	2	2-	2-	2-	1	1	2	1+	12+	1+	1	1+	2-	1+	2-	1+	2-	6	9	9	9	9	CK	0.3
																			13	22.3	16.1	19.3			0.57

Day	Three-Hourly Indices Kn								Three-Hourly Indices Ks							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1	1-	1-	1-	1	1+	1	0+	2-	1-	1	0+	1-	1	1-	0	1
2	1+	1+	2-	3-	2-	0	0+	1	2	2	2+	3-	2-	0	0+	1
3	0+	2-	3	3	3+	3-	2-	1	1+	2	3-	3-	3	3-	2	1-
4	2+	2+	2+	2-	2	1-	1+	2	3	2+	2	1+	2-	1	1+	2+
5	2	1	2+	2	2+	3-	2-	1	2+	1+	2-	2-	2	2+	2-	1
6	2+	2-	3-	2-	2	2+	2	1+	2+	2	3-	1+	2	2+	1+	1
7	1-	1	1	2	1-	1-	1-	1-	1	1-	1+	2	1-	0	0+	0+
8	1-	1+	1	1+	2	2-	2+	1	1	1+	1	1+	2-	2-	2+	1
9	0+	0+	0+	1-	1	1-	1	1	1-	1-	0+	0+	1	0+	1	1
10	0	0	0	2+	1	1	2-	2	0+	0+	0+	3-	1+	1-	2-	2-
11	2-	1+	2-	1+	2	2+	3	4+	2-	1+	2	1+	1+	2	3-	4
12	3+	4	5-	5-	3+	3+	3-	2	3+	4-	4	5-	3+	3-	2	2
13	2-	4	3-	2+	4+	1+	2+	2+	2-	4-	2+	3-	4-	1+	2+	2+
14	1	0	0	4-	2+	2+	3-	4	2-	1-	0+	4-	3-	2	3	4-
15	4	2	4+	4-	2+	2+	3-	3-	3+	2-	4-	3+	2	2	3	3
16	2+	3-	1	0+	2+	2-	2-	2+	3-	2	1	1-	2	2	1+	3-
17	2-	2+	2+	2	2+	3+	3-	3	2	3-	2-	2-	2	3-	2	3-
18	3-	3-	3	3	3-	3	4+	4	2+	2+	3-	2	3-	3	4	4+
19	5	4	4	4-	4-	3	2+	0+	5-	4-	4-	3+	3	3-	2	0+
20	0	1-	1+	2	3-	2+	1+	2	0+	1-	1-	2-	2	3-	1+	2
21	2+	0+	1	1-	1	2-	1+	2-	2-	1-	1-	1	1	1+	1+	1+
22	3	3	4+	3-	3+	3+	2+	3	3-	3-	4-	2+	3	3-	2	3
23	2+	2	2-	1	0	0	2	1+	2+	2	1+	1	1-	0+	2-	2-
24	2	1+	1+	2-	2-	1	1+	2-	1+	1+	1	2	1+	1+	1+	2-
25	1+	0+	0+	0+	0+	1+	2	2-	2-	1+	1	0+	0+	1+	2	2
26	1-	2-	1+	1+	1	1+	1-	3-	1+	2+	2-	1+	1	1+	1+	3+
27	4-	2+	3+	6-	5	5-	6-	5+	4-	3	4-	5+	6-	5+	6-	6
28	5+	6-	4	2+	3+	3+	3+	1+	5	6	4+	3-	4-	3+	4+	2
29	2-	1+	1+	2	4-	3-	1	1+	2	2-	1	2	4-	2+	1+	2-
30	1+	1	2-	2-	2	4-	2	1+	2-	1+	2-	2-	2	4-	2	1+
31	1+	1-	2-	2-	1+	2-	2-	1+	2-	1	1+	2-	1+	2-	1+	2-

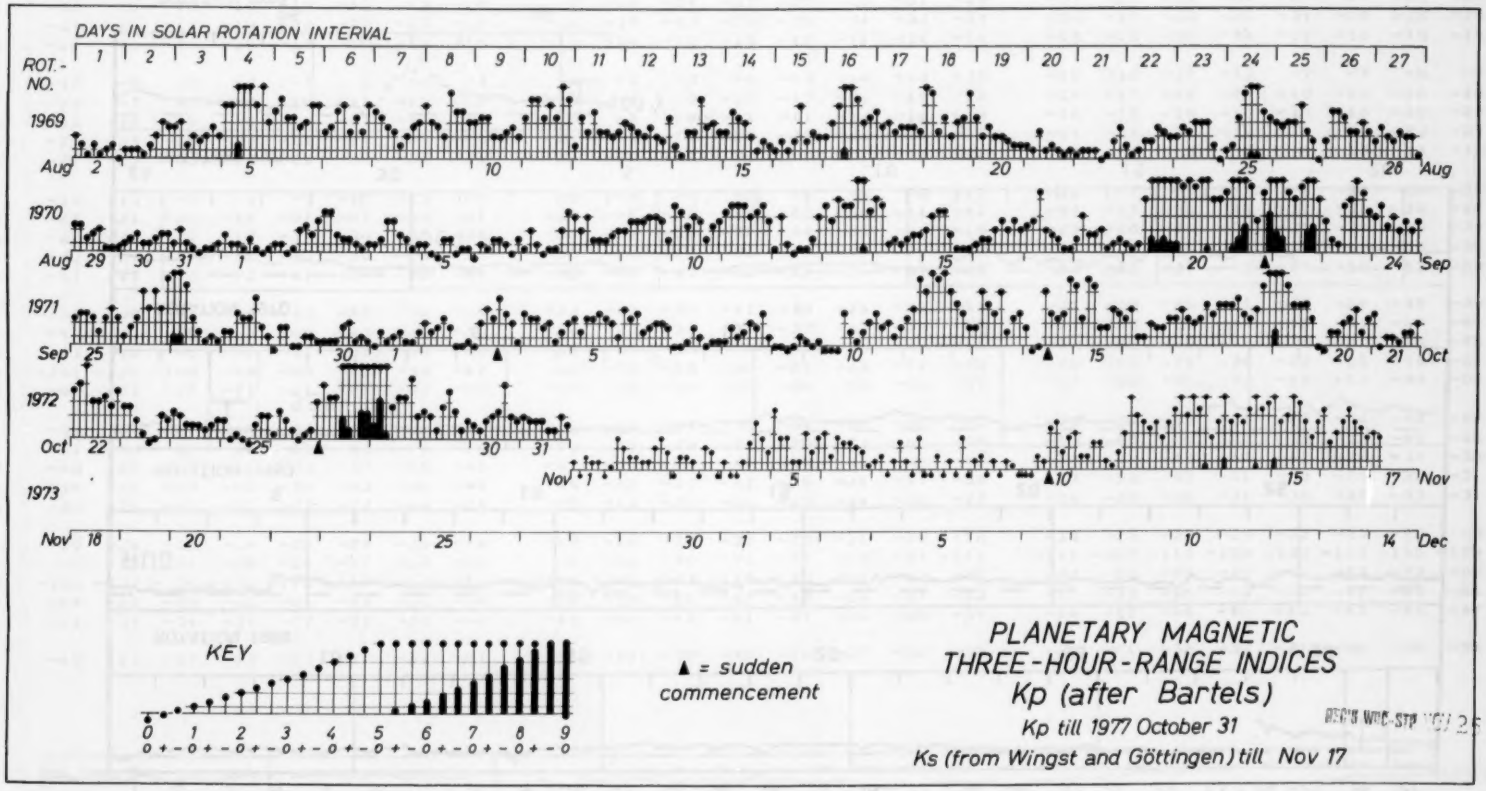
Quiet days (Q) and disturbed days (D), geomagnetic planetary three-hour-range indices (Kp) (integers alone are equivalent to those normally given with a small zero), magnetic character figures (Cp), and average amplitude (Ap) (unit 2γ) prepared by Geophysikalisches Institut at the University of Göttingen, F.R. of Germany for the International Service of Geomagnetic Indices. Ten most quiet days [Q1-Q0(10)] and five most disturbed days [D1-D5] are ordered from most quiet or disturbed, respectively. A or K means "not really quiet" (A = "Ap>6", K = "Ap ≤6 but one Kp ≥3o or two Kp values ≥3-"). An * means "not really disturbed" (Ap<20).

Georagnetic three-hourly indices (Kn), (Ks) and (Km) as in IAGA-Bulletin No. 32 and indices (aa), "antipodal", as in IAGA-Bulletin No. 33 prepared by P. N. Mayaud of the Institut de Physique du Globe, Paris, France. Really quiet (C) and quiet but slightly disturbed three-hourly intervals (K) are given for 24-hour and 48-hour intervals centered on 12 UT.

DAILY AVERAGE INDICES Ap

	1976		1977									
DAY	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
1	10	7	17	7	11	4	13	9	15	6	4	4
2	7	3	5	21	5	5	66	14	11	4	6	5
3	6	4	6	11	4	12	15	6	9	7	8	10
4	4	15	10	4	3	24	19	5	8	9	6	7
5	3	6	15	9	4	12	11	7	5	40	3	8
6	2	3	10	14	6	49	10	5	28	21	4	8
7	3	10	7	18	5	48	6	6	15	17	6	3
8	6	23	6	18	12	27	3	6	14	12	8	6
9	8	16	6	25	38	22	7	6	16	20	11	2
10	18	13	3	12	19	13	9	8	14	12	13	4
11	23	13	14	13	18	14	24	4	10	28	19	12
12	24	15	12	7	22	8	19	4	4	11	6	28
13	31	8	7	12	13	5	6	6	9	11	28	14
14	16	4	18	11	12	12	8	9	18	12	10	13
15	9	2	13	8	5	10	14	3	12	11	9	19
16	5	8	7	6	6	17	22	10	27	9	7	8
17	7	10	6	9	9	9	18	8	14	29	10	12
18	5	28	10	17	11	8	11	10	7	13	6	22
19	9	7	8	6	5	48	5	10	23	24	42	28
20	7	5	12	5	13	28	10	11	29	8	44	7
21	4	4	5	7	10	12	4	6	10	5	64	5
22	5	8	7	8	7	6	7	10	11	5	63	22
23	4	5	6	18	14	5	7	10	6	6	21	6
24	3	6	8	14	12	11	8	7	7	10	12	6
25	11	9	9	11	12	22	5	5	5	27	10	4
26	9	6	4	8	16	4	2	6	3	13	18	6
27	8	6	4	3	8	4	4	7	3	14	24	62
28	2	6	13	7	15	4	7	12	4	7	9	47
29	6	45	15		14	18	2	7	61	6	3	9
30	11	13	30		5	8	5	9	17	5	4	9
31		12	19		4		7		8	4		6
MEAN	9	10	10	11	11	16	11	8	14	13	16	13

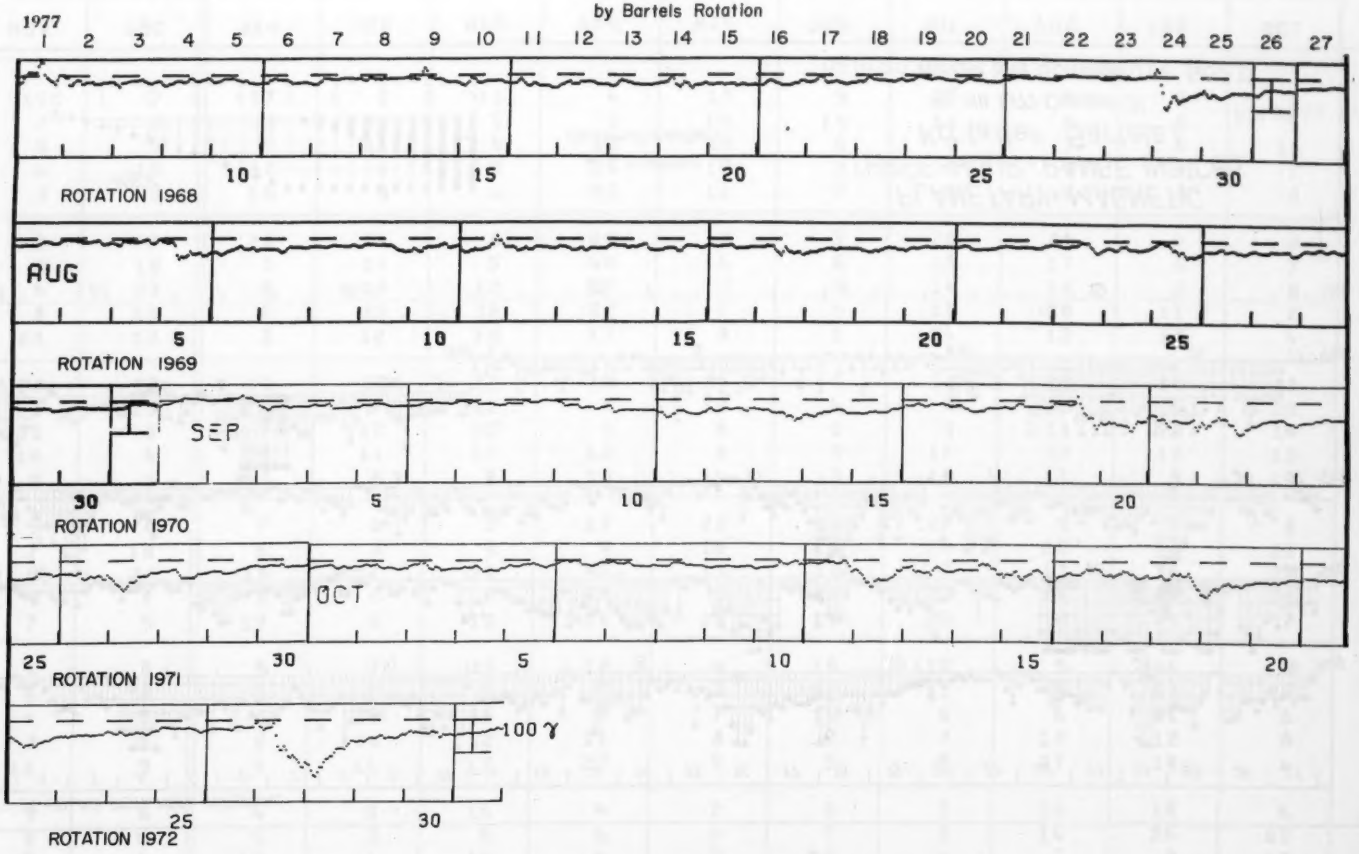
GEOMAGNETIC ACTIVITY INDICES



GEOMAGNETIC ACTIVITY INDICES

Hourly Equatorial Dst

by Bartels Rotation



Note the sensitivity indicator for each month on the last day of the month and also note that the zero reference level is different for each month.

HOURLY EQUATORIAL Dst VALUES (PROVISIONAL)

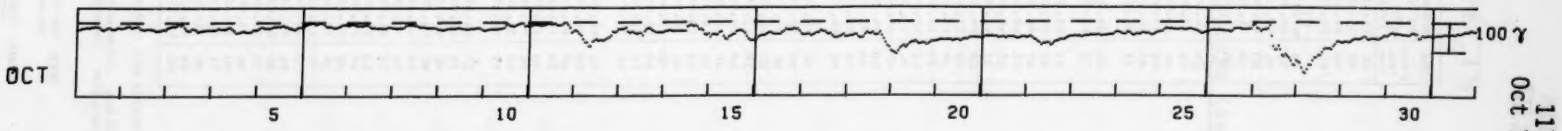
HOURLY EQUATORIAL Dst VALUES (PROVISIONAL)

NASA/GODDARD SPACE FLIGHT CENTER

OCTOBER 1977

(Time-UT) (Units-Gammas)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	-23	-23	-19	-18	-17	-16	-16	-14	-15	-13	-12	-14	-19	-24	-24	-21	-17	-17	-22	-22	-22	-17	-16	-18
2	-18	-16	-13	-12	-13	-17	-14	-13	-12	-17	-21	-23	-24	-20	-22	-22	-23	-25	-28	-27	-26	-25	-23	-25
3	-18	-15	-13	-12	-13	-10	-3	-10	-7	-16	-24	-27	-28	-20	-21	-24	-31	-29	-28	-26	-26	-24	-25	-25
4	-25	-24	-23	-19	-22	-22	-23	-21	-16	-17	-22	-28	-35	-34	-33	-31	-29	-32	-33	-33	-31	-25	-25	-24
5	-21	-16	-15	-18	-18	-19	-19	-16	-13	-14	-12	-13	-12	-10	-14	-14	-18	-19	-22	-24	-20	-16	-15	-14
6	-12	-9	-5	-3	-1	0	-6	-5	-2	-1	-3	-8	-13	-14	-13	-15	-18	-18	-15	-13	-9	-7	-8	-7
7	-10	-7	-5	-7	-10	-11	-10	-12	-10	-7	-9	-13	-17	-15	-18	-19	-18	-19	-20	-20	-18	-15	-16	-18
8	-18	-19	-19	-19	-19	-17	-11	-8	-8	-7	-9	-11	-11	-15	-16	-14	-16	-18	-18	-18	-18	-18	-20	-23
9	-23	-25	-26	-23	-21	-21	-20	-20	-21	-19	-18	-20	-22	-22	-23	-22	-21	-21	-21	-19	-19	-19	-23	-27
10	-27	-25	-23	-22	-22	-22	-22	-21	-21	-19	-17	-9	-5	-11	-12	-13	-11	-7	-5	-2	-4	-13	-11	-13
11	-12	-10	-8	-9	-9	-10	-11	-9	-8	-4	-4	-6	-5	-3	-8	-10	-10	-7	-1	-1	-9	-18	-35	-30
12	-27	-31	-38	-44	-57	-67	-58	-81	-81	-64	-62	-57	-62	-60	-61	-62	-57	-53	-50	-44	-31	-34	-30	-22
13	-22	-22	-20	-17	-31	-36	-32	-34	-37	-38	-36	-37	-44	-30	-23	-19	-21	-26	-30	-33	-35	-34	-35	-34
14	-30	-29	-27	-28	-30	-30	-29	-30	-30	-29	-29	-30	-14	-11	-9	-13	-11	-15	-24	-24	-28	-41	-43	-39
15	-51	-42	-40	-43	-41	-35	-32	-48	-56	-59	-49	-46	-42	-39	-31	-29	-27	-31	-37	-48	-57	-62	-62	-62
16	-58	-50	-46	-44	-44	-40	-36	-34	-38	-40	-40	-41	-40	-35	-31	-23	-25	-25	-25	-21	-23	-24	-30	-39
17	-42	-43	-40	-40	-46	-43	-39	-36	-36	-28	-31	-31	-37	-40	-38	-45	-51	-53	-51	-49	-45	-41	-49	-49
18	-47	-46	-46	-42	-42	-50	-54	-53	-51	-41	-36	-39	-40	-36	-42	-44	-42	-35	-46	-58	-70	-81	-85	-98
19	-101	-105	-108	-98	-88	-83	-80	-87	-80	-73	-68	-68	-64	-69	-74	-73	-70	-72	-76	-74	-69	-65	-65	-64
20	-63	-61	-60	-61	-61	-61	-60	-60	-63	-62	-60	-60	-64	-62	-58	-59	-57	-53	-51	-52	-52	-53	-53	-55
21	-53	-48	-47	-45	-47	-47	-48	-49	-52	-51	-50	-50	-54	-50	-50	-50	-49	-52	-55	-55	-52	-50	-50	-53
22	-51	-48	-52	-58	-61	-66	-70	-78	-73	-72	-70	-71	-79	-75	-68	-65	-63	-60	-60	-60	-56	-52	-49	-48
23	-46	-46	-49	-46	-50	-49	-46	-45	-47	-43	-44	-44	-44	-42	-44	-46	-44	-44	-43	-41	-42	-41	-37	-33
24	-34	-36	-39	-40	-39	-33	-36	-40	-44	-43	-39	-41	-39	-35	-37	-38	-37	-39	-43	-41	-38	-34	-33	-31
25	-30	-24	-20	-21	-22	-22	-24	-24	-25	-23	-22	-24	-25	-24	-22	-22	-24	-26	-28	-31	-36	-37	-33	-31
26	-29	-26	-25	-24	-26	-24	-26	-26	-27	-28	-28	-31	-28	-21	-19	-18	-19	-22	-22	-22	-22	-20	-20	-9
27	-6	-18	-21	-29	-24	-22	-23	-19	-9	-46	-80	-91	-90	-79	-91	-111	-114	-107	-113	-120	-130	-143	-145	-129
28	-134	-137	-154	-168	-172	-159	-143	-143	-128	-116	-117	-111	-110	-99	-88	-87	-87	-86	-89	-79	-72	-63	-63	-66
29	-67	-64	-63	-66	-64	-60	-56	-54	-56	-55	-52	-47	-48	-53	-57	-53	-54	-53	-56	-55	-52	-47	-43	-46
30	-41	-37	-34	-35	-37	-38	-38	-40	-41	-40	-42	-41	-37	-35	-38	-39	-54	-52	-44	-46	-45	-43	-44	-47
31	-49	-44	-43	-43	-43	-41	-39	-41	-42	-40	-39	-40	-40	-37	-38	-37	-34	-31	-32	-32	-27	-26	-30	-28



PRINCIPAL MAGNETIC STORMS

OCTOBER 1977

OBS. 2 letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	hr min (UT)	TYPE	SC - AMPLITUDES D(')	H(γ)	Z(γ)	MAXIMUM 3 HOUR - INDEX K DAY(3 HOUR PERIOD)	K	RANGES D(')	H(γ)	Z(γ)	UT END DAY	HOUR
NE	55.1N	3	04--	..	..	..	..	03(4)	5	23	62	39	03	24
HO	07.6N	3	1245	SC	- 0.3	+20	- 1	03(5)	4	5	99	32	04	13
HU	00.6S	3	1246	SC	2	86	3	03(5,6)	5	6	225	45	03	23
KG	56.5S	3	1245	SC	--	--	--	03(5)	3				04	09
CO	64.6N	11	19--	..	..	..	..	12(3,4)	7	258	1620	630	12	18
SI	60.0N	11	19--	..	..	..	..	12(3)	7	--	620	520	12	15
NE	55.1N	11	1937	SC	2	15	--	12(3)	6	38	120	174	13	19
BO	48.9N	11	19--	..	..	..	..	12(3)	5	22	83	42	13	18
IR	41.0N	11	12--	..	..	..	..	12(4) 13(5)	6	20	96	37	13	18
GM	24.5N	11	1300	..	..	..	..			5	95	36	13	16
JP	17.3N	11	1300	..	..	..	..			4	96	34	13	16
SH	14.6N	11	1300	..	..	..	..			4	107	25	13	16
UJ	13.5N	11	1300	..	..	..	..			4	97	33	13	16
AL	09.5N	11	1300	..	..	..	..	12(4,6)	5	3	96	27	13	16
HO	07.6N	11	0740	SC	- 0.1	+ 9	- 1	12(6)	5	4	139	24	13	17
AN	01.5N	11	1300	..	..	..	..			3	143	49	13	16
TV	01.1S	11	1300	..	..	..	..			2	161	77	13	16
GU	04.0N	12	0151	SC	-02	18	-04	13(5)	5	18	140	28	13	15
GN	43.3S	12	0151	SC	- 3.6	- 7	-12	12(4)	6	19	80	110	12	21
SI	60.0N	14	1153	SC*	- 5.3*	+45.2*	+ 7.4*	19(1)	6	70	460	360	19	20
NE	55.1N	14	1151	SC*	2	22	3	15(3)	5	33	102	97	16	09
WI	54.2N	14	1151	SC*	- 8 *	+45 *		14(8)	6	27	165	35	16	02
FR	49.6N	14	1152	SC	+ 2	+20	- 5	15(1) 18(8) 19(1)	5	18	132	70	19	15
BO	48.9N	14	1152	SC*	- 6	+31	+ 5	15(3)	5	19	98	42	15	17
IR	41.0N	14	1151	SC	4.5	39	7	14(8) 15(3,4)	5	11	90	25	15	23
GM	24.5N	14	1151	SC	- 0.5	30	- 3			8	83	--	15	20
HO	21.1N	14	1151	SC	01	08	03	14(3)	4	6	19	3	15	23
JP	17.3N	14	1151	SC	- 0.8	30	- 6			7	81	55	15	20
SH	14.6N	14	1151	SC	- 0.2	28	6			5	87	47	15	20
UJ	13.5N	14	1151	SC	- 0.3	36	- 8			7	93	54	15	20
AL	09.5N	14	1151	SC	- 0.5	27	- 5	15(3)	6	6	89	54	15	20
HO	07.6N	14	1140	SC	- 0.3	+31	- 2	15(3)	5	6	116	40	15	23
GU	04.0N	14	1151	SC	--	28	-17	15(3)	5	0	100	30	15	21
AN	01.5N	14	1151	SC	- 1.1	37	21			5	181	84	15	20
TV	01.1S	14	1151	SC	0.2	33	41			3	231	107	15	20
KG	56.5S	14	1151	SC	--	--	--	14(8) 15(1,3,4)	4				16	09
CO	64.6N	18	02--	..	..	..	..	18(3) 19(1,4,5)	6	192	1480	490	19	19
NE	55.1N	18	13--	..	..	..	..	19(1)	7	48	186	193	19	19
WI	54.2N	18	15--	..	..	..	..	19(1)	6	33	140	100	19	20
BO	48.9N	18	01--	..	..	..	..	19(1)	6	23	123	66	19	20
IR	41.0N	18	03--	..	..	..	..	18(7,8) 19(1,4,5)	5	25	151	43	19	18
GM	24.5N	18	1000	..	..	..	..			6	79	42	19	20
JP	17.3N	18	1000	..	..	..	..			4	72	27	19	20
SH	14.6N	18	1000	..	..	..	..			5	81	30	19	20
UJ	13.5N	18	1000	..	..	..	..			4	77	26	19	20
AL	09.5N	18	1000	..	..	..	..	18(8)	5	3	62	24	19	20
HO	07.6N	18	0600	SC	..	..	..	18(6,7,8)	4	4	103	15	19	20
AN	01.5N	18	1000	..	..	..	..			4	83	34	19	20
TV	01.1S	18	1000	..	..	..	..			3	115	69	19	20
HR	33.7S	18	1800	..	..	..	..	18(7,8)	5	21	57	69	19	16
BO	48.9N	21	22--	..	..	..	..	22(3)	5	15	54	28	23	11
GM	24.5N	21	2300	..	..	..	..			4	65	18	22	23
JP	17.3N	21	2300	..	..	..	..			3	61	16	22	23
SH	14.6N	21	2300	..	..	..	..			2	68	10	22	23
UJ	13.5N	21	2300	..	..	..	..			3	53	17	22	23
AL	09.5N	21	2300	..	..	..	..	22(5,6)	4	3	53	21	22	23
AN	01.5N	21	2300	..	..	..	..			3	93	502	22	37
TV	01.1S	21	2300	..	..	..	..			3	125	60	22	23
CO	64.6N	26	2329	SC*	+13	+23	+10	27(4,5,6)	7	307	1980	730	28	21
SI	60.0N	26	2331	SC*	- 5.0*	+37.7*	+ 5.2*	27(5)	7	--	--	--	28	21
NE	55.1N	26	2329	SC*	3	18	--	27(4,5,6,8) 28(1,2)	6	53	297	509	29	07
WI	54.2N	26	2331	SC	- 2	+35		28(2)	7	44	200	190	28	21
FR	49.6N	26	2329	SC*	+ 2	+21	- 5	27(4,5,8) 28(1,2)	6	36	214	183	29	15
BO	48.9N	26	2331	SC*	- 1	+20	- 3	28(5)	6	34	230	181	28	21
IR	41.0N	26	2330	SC*	3.5	13	3	27(6)	7	35	201	84	28	21
SJ	29.9N	26	2330	SC	+ 0.5	+11	+02	27(7)	6	10	202	52	28	08
GM	24.5N	26	2330	SC	- 6	19	- 2			11	203	58	29	02
HO	21.1N	26	2330	SC*	02	07	03	28(2)	8	9	78	4	29	06
JP	17.3N	26	2330	SC	- 0.8	18	- 4			8	209	41	29	02
SH	14.6N	26	2330	SC	- 0.4	15	3			6	212	37	29	02
UJ	13.5N	26	2330	SC	- 0.5	21	- 5			6	223	31	29	02
AL	09.5N	26	2330	SC	- 0.5	16	- 5	27(4)	7	6	202	38	29	02
HO	07.6N	26	2328	SC	- 0.4	+19	- 1	27(4,5,6)	7	6	239	39	29	18
GU	04.0N	26	2329	SC*	--	38	-09	27(4)	7	0	230	30	28	20
AN	01.5N	26	2330	SC	- 0.9	21	11			5	239	108	29	02
HU	00.6S	26	2329	SC	1	24	4	27(5,7)	6	12	266	37	28	20
TV	01.1S	26	2330	SC	0.0	14	19			4	288	193	29	02
HR	33.7S	26	2330	SC	+ 1	+21	+17	27(5,6,8)	6	37	174	134	28	20
GN	43.3S	26	2329	SC*	- 2.5	+ 7	- 9	27(6,7,8)	6	26	180	180	28	22
KG	56.5S	26	2330	SC	--	--	--	28(2)	8				28	21

Reports were received from the following observatories:

Alibag Annamalainagar Boulder College Fredericksburg Gnangara Guam Hermanus Honolulu Huancayo Hyderabad Irkutsk
Kerguelen Newport San Juan Shillong Sitka Trivandrum Ujjain Witteveen

Note: New station data from Gulmarg, code GM, N34.05 E74.40 geographic coordinates, N24.5 E147.2 geomagnetic coordinates, are included in this table.

Errata: Data from Annamalainagar for 30 November 1976, sudden commencement beginning at 0505 UT: H amplitude should read "17" gamma instead of "7" gamma. These data appear on page 107 of the SGD, 389 Part I, January 1977 issue.

SUDDEN COMMENCEMENTS AND SOLAR FLARE EFFECTS

OCTOBER 1977

PRELIMINARY REPORT ON RAPID MAGNETIC VARIATIONS

The meaning of the station symbols is given in the IAGA-Bulletin nr. 32.
Times of ssc are mean values.

Sudden commencements followed by a magnetic storm or a period of storminess (ssc)

03 1246 A: SO DO DB FU AE HU LM; B: WN WI CF AQ EB CI
KG; C: NI TL DU (si: A: DO; B: CZ)

14 1151 A: SO NU DB FU CF MT AQ EB FR AE KS KY HU LM
GN CZ; B: WN WI NI CI TL KA SZ KG; C: MT KY DU

26 2330 A: SO VI FR HU LM KG; B: DO NU WN WI FU CF MT AQ
EB CI TL AE KA KY SZ GN CZ; C: NI DU

Solar-flare effects (sfe)

Effects confirmed by ionospheric or solar observations are underlined

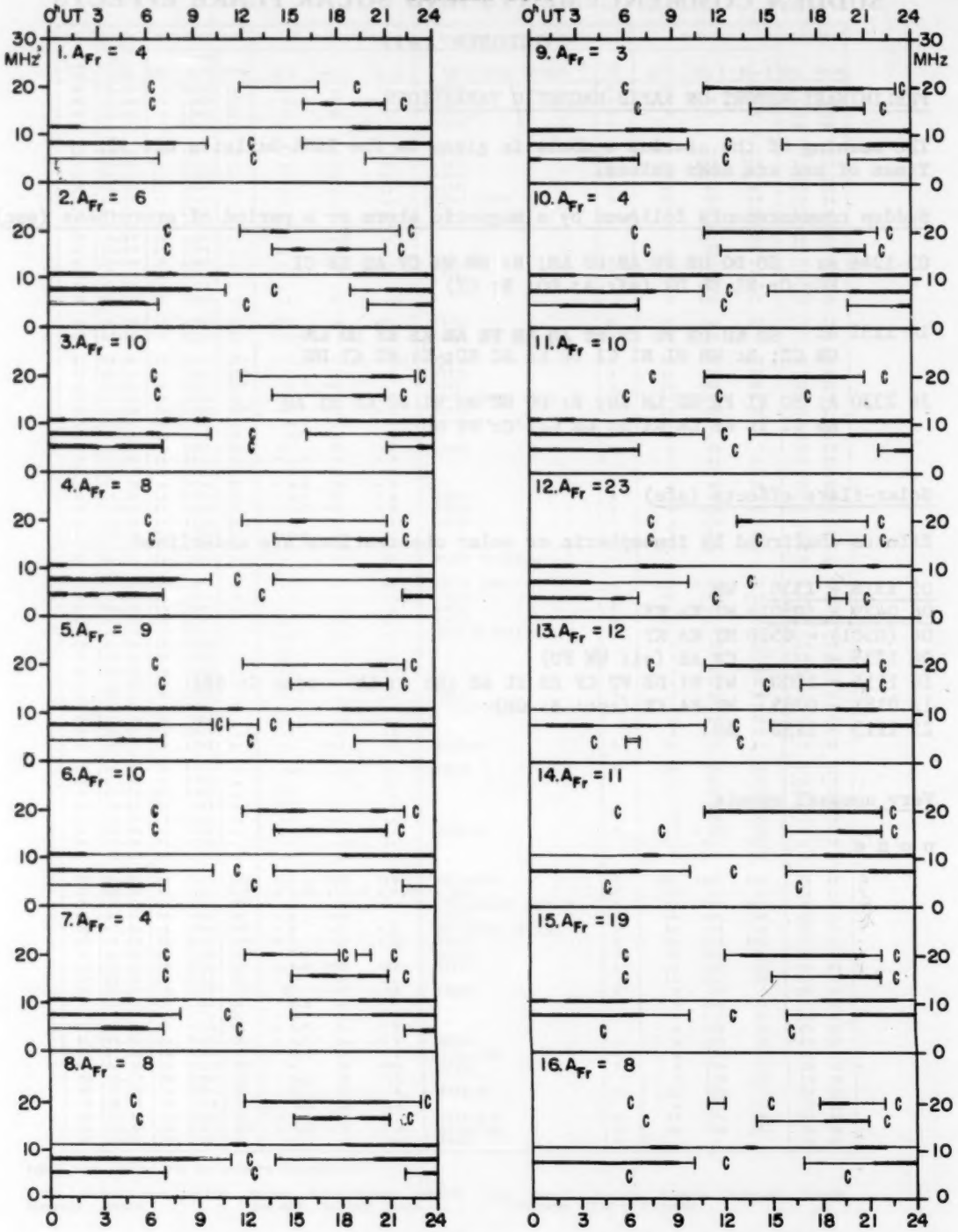
05 1318 - 1330 WN
06 0429 - (0501) MT KA KY
06 (0501) - 0520 MT KA KY
06 1235 - CF AE (si: WN FU)
10 1115 - 1200 WI NI DB FU CF EB TL AE (b: A: LM - ssc: C: SZ)
12 0151 - 0255 MT KA KY (ssc: B: GN)
25 1115 - 1132 SO

Very unusual events

n o n e

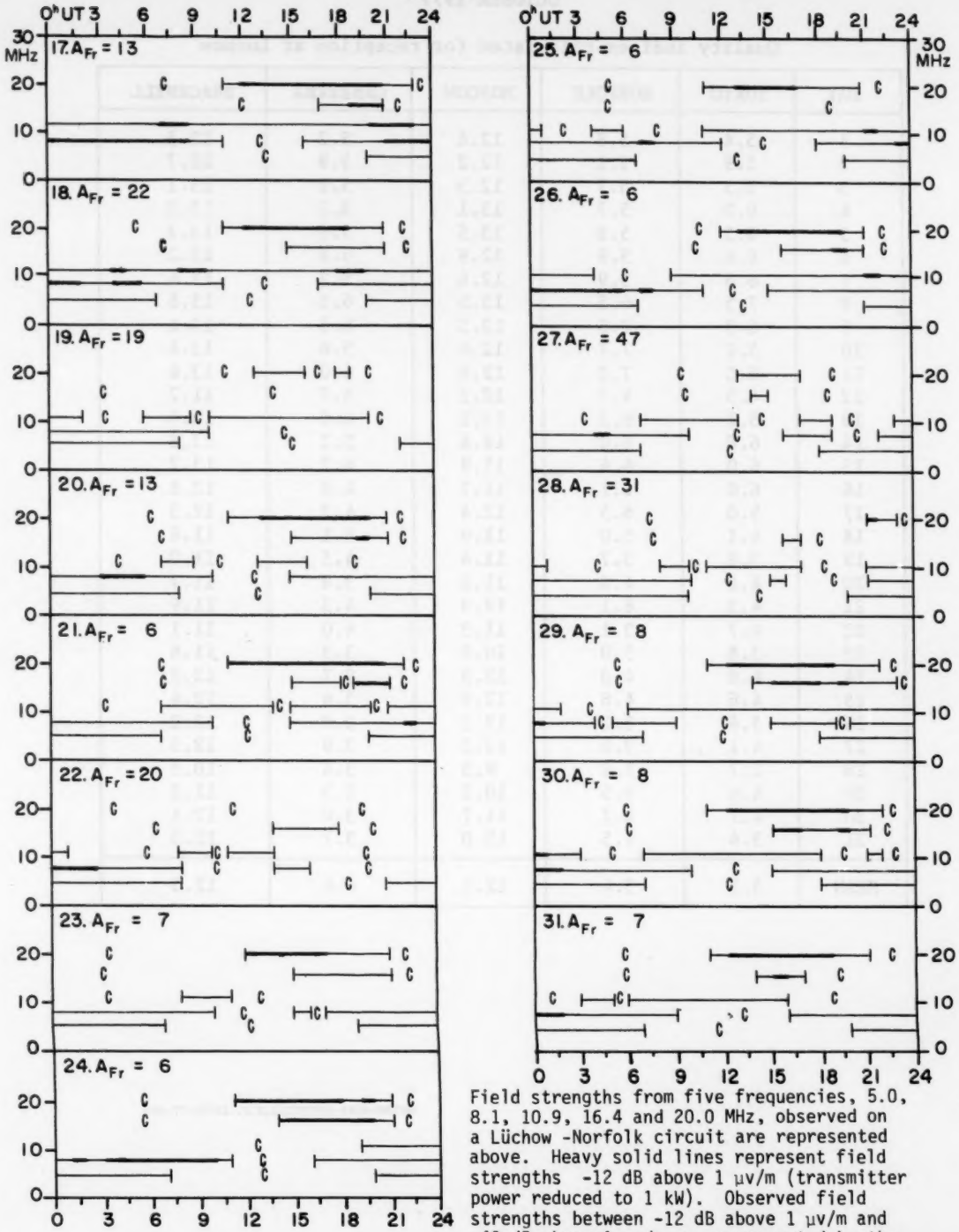
TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

OCTOBER 1977



TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

OCTOBER 1977



Field strengths from five frequencies, 5.0, 8.1, 10.9, 16.4 and 20.0 MHz, observed on a Lüchow -Norfolk circuit are represented above. Heavy solid lines represent field strengths -12 dB above 1 μv/m (transmitter power reduced to 1 kW). Observed field strengths between -12 dB above 1 μv/m and -40 dB above 1 μv/m are represented by the fine line. Adapted from Observations by Deutsche Bundespost

RADIO PROPAGATION QUALITY INDICES

OCTOBER 1977

Quality indices calculated for reception at Lüchow

DAY	TOKYO	NORFOLK	MOSCOW	CANBERRA	BRACKNELL
1	5.4	5.8	12.6	5.2	12.5
2	5.9	5.1	12.2	5.9	12.7
3	5.3	5.7	12.3	5.2	13.1
4	6.0	5.7	13.1	5.2	13.2
5	6.5	5.8	13.5	5.6	13.2
6	6.4	5.9	12.9	5.9	13.2
7	6.8	5.9	12.6	5.2	13.4
8	7.5	6.5	13.5	6.3	13.6
9	6.3	7.0	12.5	6.5	13.6
10	5.7	7.7	12.6	5.6	13.4
11	6.5	7.2	12.6	6.0	13.6
12	4.5	4.7	12.2	5.7	11.7
13	5.7	6.2	13.1	4.0	13.3
14	6.8	8.0	12.6	5.2	13.8
15	6.0	6.4	11.9	4.2	13.2
16	6.0	6.1	11.7	4.8	12.8
17	5.0	6.5	12.4	4.7	12.3
18	4.1	5.0	11.9	4.1	11.8
19	3.8	3.7	11.4	4.5	11.0
20	4.6	4.8	11.2	3.8	11.7
21	4.3	6.1	12.3	4.3	11.9
22	4.7	3.1	11.3	4.0	11.1
23	3.8	5.0	10.8	3.3	11.6
24	4.8	4.8	12.5	3.7	12.2
25	4.6	4.8	12.6	3.4	12.4
26	5.6	5.2	12.3	3.8	12.2
27	4.1	3.9	12.2	3.9	12.5
28	2.7	1.8	9.5	3.4	10.3
29	4.4	4.5	10.2	3.3	11.2
30	4.7	4.7	11.7	3.0	12.1
31	5.4	4.5	12.0	3.7	12.3
MEAN	5.3	5.4	12.1	4.6	12.5

USCOMM-NOAA-ASHEVILLE,N.C.-12/30/77-950

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Data

Explan

no

December 1977 Number 400-Part II

P-A STACKS

JAN 2 1978

Solar-Geophysical Data comprehensive reports

Data for June 1977–May 1977 & Miscellanea

Explanation of Data Reports Issued as Number 390 (Supplement) February 1977

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Solar - Geophysical Data

NO. 400 DECEMBER 1977

Part II (Comprehensive Reports)

DATA FOR
JUNE 1977
MAY 1977
& MISCELLANEA

NATIONAL GEOPHYSICAL AND SOLAR - TERRESTRIAL DATA CENTER
BOULDER, COLORADO

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SOLAR - GEOPHYSICAL DATA

No. 400

Issued in two parts

Helen E. Coffey, Editor

J. Virginia Lincoln, Director
Solar - Terrestrial Data Services Division

CONTENTS

Part I (Prompt Reports)

	Page
Index for 1976 and 1977	2
Data for November 1977	3-25
Data for October 1977	27-122

Part II (Comprehensive Reports)

Index for 1976 and 1977	2
Data for June 1977	3-38
Data for May 1977	39-49
Miscellaneous Data	51-71

Daily Solar Activity Centers
2 cm Spectroheliograms September 1977
8.6 mm Spectroheliograms September 1977

Solar Radio Waves
Spectral Observations Culgoora August 1977
Selected Solar Noise Bursts September 1977

Cosmic Rays
Sulphur Mountain, Calgary August - September 1977
Chart of Variations
Neutron Monitors Daily Values

Abbreviated Calendar Record
U.S.S.R. Aurora April 1977

INDEX FOR 1976 - 1977 DATA PUBLISHED IN "SOLAR-GEOPHYSICAL DATA"

		1977 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
A.	Solar and Interplanetary Phenomena	391A 34	392A 28	393A 34	394A 32	395A 36	396A 35	397A 32	398A 36	399A 34	400A 30	
A.1	Sunspot Drawings	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7	398A 7	399A 7	400A 7
A.2a	Zürich Provisional Relative Sunspot Numbers R_z											
A.2b	Zürich Final Sunspot Numbers R_z	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7	398A 7	399A 7	400A 7
A.2c	American Relative Sunspot Numbers R_A'	391A 34	392A 28	393A 34	394A 32	395A 36	396A 34	397A 32	398A 36	399A 34	400A 30	
A.3a	Mt. Wilson Magnetograms	391A 96	392A 84	393A 96	394A 92	395A 98	396A 94	397A 94	398A 98	399A 94	400A 92	
A.3b	Mt. Wilson Magnetic Characteristics of Sunspots	391A 34	392A 28	393A 34	394A 32	395A 36	396A 34	397A 32	398A 36	399A 34	400A 30	
A.3c	Kitt Peak Magnetograms	390A 21	391A 29	392A 21	393A 29	394A 27	395A 29	396A 29	397A 25	398A 29	399A 29	400A 24
A.3d	Mean Solar Magnetic Field (Stanford)	391A 34	392A 28	393A 34	394A 32	395A 36	396A 35	397A 32	398A 36	399A 34	400A 30	
A.4	Hα Filtergrams	391A 34	392A 28	393A 34	394A 32	395A 36	396A 35	397A 32	398A 36	399A 34	400A 30	
A.5	Calcium Plage Drawings - McMath (or Catania)	391A 96	392A 84	393A 96	394A 92	395A 98	396A 94	397A 94	398A 98	399A 94	400A 92	
A.5a	Calcium Plage (McMath) and Sunspot Regions	391A101	392A 88	393A100	394A 96	395A104	396A 99	397A101	398A105	399A 99	400A 99	
A.5b	McMath Daily Calcium Plage Indices	391A 32	392A 26	393A 32	394A 30	395A 34	396A 32	397A 30	398A 34	399A 32	400A 28	
A.6	Hα Synoptic Charts	395B 4	396B 4	397B 4	398B 4	399B 4	400B 4					
A.6b	Synoptic Chart and Active Regions (Paris)	390A 18	391A 22	392A 18	----	394A 21	----	396A 20	397A 19	398A 24	399A 24	400A 21
A.7f	Helium D3 Chromosphere (Big Bear)	390A 19	391A 23	392A 19	393A 23	394A 22	395A 24	396A 22	397A 20	398A 22	399A 23	400A 20
A.7g	Helium Synoptic Maps (KPNO)	391A 34	392A 28	393A 34	395B 36	395A 36	396A 34	397A 32	398A 36	399A 34	400A 30	
A.7h	Coronal Line Emission (Sac Peak)	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7	398A 7	399A 7	400A 7
A.8aa	2800 MHz - Daily Values of Solar Flux (ARO-Ottawa)	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7	398A 7	399A 7	400A 7
A.8ac	2800 MHz - Daily Values of Adj. Solar Flux (ARO-Ottawa)	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7	398A 7	399A 7	400A 7
A.8g	Daily Values of Adjusted Solar Flux (AFGL)	391A 34	392A 28	393A 34	394A 32	395A 36	396A 35	397A 32	398A 36	400B 57	400A 30	
A.9cb	8.6 mm Radio Maps of the Sun (NOSC - La Posta)	391A 34	392A 28	393A 34	394A 32	395A 36	396A 35	397A 32	398A 36	400B 52	400A 30	
A.9d	2 cm Radio Maps of the Sun (NOSC - La Posta)	390A 12	391A 13	392A 12	393A 13	394A 12	395A 14	396A 12	397A 13	398A 14	399A 14	400A 12
A.10a	169 MHz - Interferometric Observations (Nancay)	391B 43	391A 15	393B 35	393A 15	394A 14	395A 16	396A 14	397A 15	398A 16	399A 16	400A 14
A.10c	21 cm East-West Solar Scans (Fleurs)	391B 44	391A 16	393B 36	393A 16	394A 15	395A 17	396A 15	397A 16	398A 17	399A 17	400A 15
A.10d	43 cm East-West Solar Scans (Fleurs)	390A 13	391A 14	392A 13	393A 14	394A 13	395A 15	396A 13	397A 14	398A 15	399A 15	400A 13
A.10e	10.7 cm East-West Solar Scans (Ottawa-ARO)	390A 15	391A 19	392A 15	393A 20	394A 18	395A 21	396A 17	----	398A 25	399A 20	400A 17
A.11g	Solar X-ray (SMS/GOES)	391A 34	392A 28	393A 34	394A 32	395A 36	396A 34	397A 32	398A 36	399A 34	400A 30	
A.11h	Solar X-ray (OSO-8; 1975-057A)				398B 27							
A.11i	Solar X-ray (Columbia U.)	----	391A 25	----	393A 24	394A 23	395A 26	396A 24	397A 23	----	399A 26	----
A.12ba	Cosmic Ray Protons (Pioneers 6 & 7)	----	391A 27	----	393A 26	394A 24	395A 27	396A 25	----	----	399A 27	----
A.12bb	Cosmic Ray Protons (Pioneers 8 & 9)	395B 17	396B 20	397B 15	398B 22	399B 18	400B 34					
A.12e	Energetic Solar Particles (IMP H & J)	----	391A 25	----	393A 24	394A 23	395A 26	396A 24	397A 23	----	399A 26	----
A.13a	Solar Wind (Pioneers 6 & 7)	----	391A 27	----	393A 26	394A 24	395A 27	396A 25	----	----	399A 27	----
A.13ab	Solar Wind (Pioneers 8 & 9)	390A 24	391A 24	392A 23	393A 27	394A 25	395A 31	396A 27	397A 27	398A 27	399A 25	400A 25
A.13d	Solar Wind from IPS Measurements	395B 17	396B 19	397B 15	398B 21	399B 17	400B 33					
A.13e	Solar Plasma (IMP H & J)	----	----	----	----	----	395A 27	396A 25	----	----	----	----
A.17	Interplanetary Magnetic Field (Pioneer 8)	----	391A 27	----	393A 26	394A 24	----	396A 26	----	----	----	----
A.17	Interplanetary Magnetic Field (Pioneer 9)	390A 20	391A 28	392A 20	393A 28	394A 26	----	396A 28	397A 24	398A 28	400A 22	400A 22
A.17c	Inferred IP Magnetic Field	----	----	----	----	----	395A 27	396A 25	----	----	399A 27	----
A.18	Interplanetary Electric Field (Pioneer 8)	----	391A 27	----	393A 28	394A 24	----	396A 26	----	----	----	----
A.18	Interplanetary Electric Field (Pioneer 9)											
B.	Ionospheric (and Radio Wave Propagation) Phenomena	391A118	392A104	393A122	394A118	395A122	396A118	397A120	398A124	399A128	400A 120	
B.52	Graphs of Transmission Frequency Range	391A120	392A103	393A121	394A120	395A124	396A120	397A122	398A126	399A127	400A 122	
B.53	Quality Figures Based on Frequency Ranges											
C.	Flare-Associated Events	390A 10	391A 11	392A 10	393A 10	394A 10	395A 10	396A 10	397A 10	398A 10	399A 10	400A 10
C.1a	Optical Observations Flares	395B 8	396B 8	397B 8	398B 8	399B 8	400B 8					
C.1ba	Optical Observations Flares (Standardized Data)	390A 11	391A 12	392A 11	393A 12	394A 11	395A 13	396A 11	397A 12	398A 13	399A 13	400A 11
C.1d	Flare Patrol Observations	395B 13	396B 13	397B 11	398B 14	399B 13	400B 19					
C.1d	Flare Patrol Observations	395B 12	396B 12	397B 10	398B 13	399B 12	400B 18					
C.1e	Flare Indices (by day)	396B 35	397B 31	398B 41	399B 33	400B 49						
C.1f	Flare Indices (by Region)	395B 14	396B 14	397B 12	398B 15	399B 14	400B 20					
C.3	Solar Radio Waves - Outstanding Occurrences	390A 14	391A 17	392A 14	393A 17	394A 16	395A 18	396A 16	397A 17	398A 18	399A 18	400A 16
	Solar Radio Waves - Fixed Frequencies - Selected	393B 40	393B 41	393A108	394A105	396B 41	398B 44	398B 46	399B 36	399A113		
C.3t	43.25, 80 and 160 MHz Selected Bursts (Culgoora)	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103	398A107	399A102	400A 101	
C.4a	Solar Radio Spectral Obs. (Fort Davis)	----	----	----	----	----	----	----	----	----	----	
C.4b	Solar Radio Spectral Obs. (Boulder)	391A103	393B 37	393A102	394A 98	396B 38	397B 34	397A103		399A102		
C.4d	Solar Radio Spectral Obs. (Culgoora)	391A103	392A 90	393A102	394A 98	395A106	397B 34	397A103	398A107	399A102	400A 101	
C.4e	Solar Radio Spectral Obs. (Weissenau)	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103	398A107	399A102	400A 101	
C.4f	Solar Radio Spectral Obs. (Sagamore Hill)	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103	398A107	399A102	400A 101	
C.4h	Solar Radio Spectral Obs. (Dwingeloo)	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103	398A107	399A102	400A 101	
C.4i	Solar Radio Spectral Obs. (Dürnten)	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103		399A102	400A 101	
C.4j	Solar Radio Spectral Obs. (Manila)	390A 17	391A 21	392A 17	393A 22	394A 20	395A 21	396A 17	397A 22	399B 37	399A 22	400A 19
C.5e	Solar X-ray (SMS/GOES)				396B 27							
C.5f	Solar X-ray (Columbia U.)	391A102	392A 89	393A101	394A 97	395A105	396A100	397A102	398A106	399A100	400A 100	
C.6	Sudden Ionospheric Disturbances											
D.	Geomagnetic and Magnetospheric Phenomena	391A114	392A 97	393A114	394A111	395A115	397B 39	397A114	398A117	399A120	400A 113	
D.1a	Geomagnetic Indices Kp, Kn, Ks, Km, Ap, aa, Cp	391A116	392A 99	393A116	394A113	395A117	396A113	397A116	398A119	399A122	400A 115	
D.1ba	27-day Chart of Kp Indices											
D.1c	27-day Chart of C9	391A117	392A101	393A119	394A116	395A120	396A116	397A119	398A122	399A125	400A 118	
D.1d	Principal Magnetic Storms					----						
D.1e	Reduced Magnetograms	392B 38	392A102	393A120	394A117	395A121	396A117	398B 47	398A123	399A126	400A 119	
D.1f	Sudden Commencement and Solar Flare Effects		392A100	393A118	394A115	395A119	396A115	397A118	398A121	399A124	400A 117	
D.1g	Equatorial Indices Dst											
F.	Cosmic Rays	391A109	393B 44	393A109	394A110	395A114	396A110	397A109	398A116	399A115	400A 112	
F.1a	Cosmic Ray Neutron Counts (Deep River)	391A109	392A 96	393A109	394A110	395A114	396A110	397A109	398A116	399A115	400A 112	
F.1b	Cosmic Ray Neutron Counts (Climax)	391A109	393B 44	393A109	394A110	395A114	396A110	397A109	398A116	399A115	400A 112	
F.1e	Cosmic Ray Neutron Counts (Alert)	393B 44	394B 36	394B 36	394A110	395A114	396A110	397A109	400B 70	400B 70		
F.1f	Cosmic Ray Neutron Counts (Calgary)	393B 44	394B 36	394B 36	394A110	395A114	396A110	397A109	400B 70	----		
F.1g	Cosmic Ray Neutron Counts (Sulphur Mountain)											
F.1h	Cosmic Ray Neutron Counts (Thule)	391A109	392A 96	393A109	394A110	395A114	396A110	397A109	398A116	399A115	400A 112	
F.1i	Cosmic Ray Neutron Counts (Kiel)	391A109	392A 96	393A109	394A110	395A114	396A110	397A109	398A116	399A115	400A 112	
F.1j	Cosmic Ray Neutron Counts (Tokyo)					395A114	396A110	397A109	398A116			
F.1k	Cosmic Ray Neutron Counts (Kula)											
H.	Miscellaneous	390A 4	391A 5	392A 5	393A 5	394A 5	395A 4	396A 5	397A 4	398A 4	399A 4	400A 4
H.60	TOWDS Alert Decisions	396B 28	397B 24	398B 34	399B 26	400B 42						
H.62	Abbreviated Calendar Record											

Note: A = Part I, B = Part II.

386A 22 listed under 1976 Aug shows that data for August 1976 were contained in *Solar-Geophysical Data* Number 386 - Part I beginning on page 22.

JUNE 1977 DATA

Contents

	Page
Active Regions	4-5
Synoptic Solar Maps	6-7
Solar Flares	
Hα Solar Flares (Standardized Data)	8-18
Daily Flare Indices	18
No-Flare-Patrol Chart	19
Solar Radio Waves	
Worldwide Outstanding Occurrences at Fixed Frequencies	20-32
Energetic Solar Particles and Plasma	33-38
Solar X-Ray Radiation (Data not available at time of publication)	
Magnetograms of Geomagnetic Storm (Data not available at time of publication)	

ACTIVE REGIONS

CARRINGTON ROTATION 1655

(May 17 - June 13, 1977)

Region No.	Coordinates		Age at CMP	IMP.	Spot-less Region	Region No. in Rotation 1654	Activity at West Limb
	Lat.	Long.					
1	26°S	332°	-1	1	x		dispersed
2	20 N	317	>6	1	x		decreasing
3	34 N	285	>6	1	x		decreasing
4	39 N	278	>6	1	x		decreasing
5	24 S	239	+3	1	x		disappeared
6	20 N	209	0	4			decreasing
7	25 S	203	>6	1	x	(7)	disappeared
8	23 S	202	-3	2			stable
9	26 N	201	+6	1	x		disappeared
10	20 N	200	>6	1	x		dispersed
11	22 S	197	+2	1	x		dispersed
12	10 N	184	+3	1	x		disappeared
13	19 N	180	+6	1	x		dispersed
14	4 S	151	-2	1	x		disappeared
15	22 N	146	-4	2			increasing
16	21 N	122	+5	3			decreasing
17	19 N	116	>6	1	x		decreasing
18	32 N	114	>6	1	x	(12)	decreasing
19	39 N	94	>6	1	x		decreasing
20	25 S	65	+7	4			decreasing
21	23 S	23	>6	1	x	(18+20)	dispersed
22	9 S	21	+6	1	x		disappeared
23	22 S	3	>6	3			decreasing
24	29 S	1	>6	1	x	(21)	dispersed

ACTIVE REGION

CARRINGTON ROTATION 1656

(June 13 - July 10, 1977)

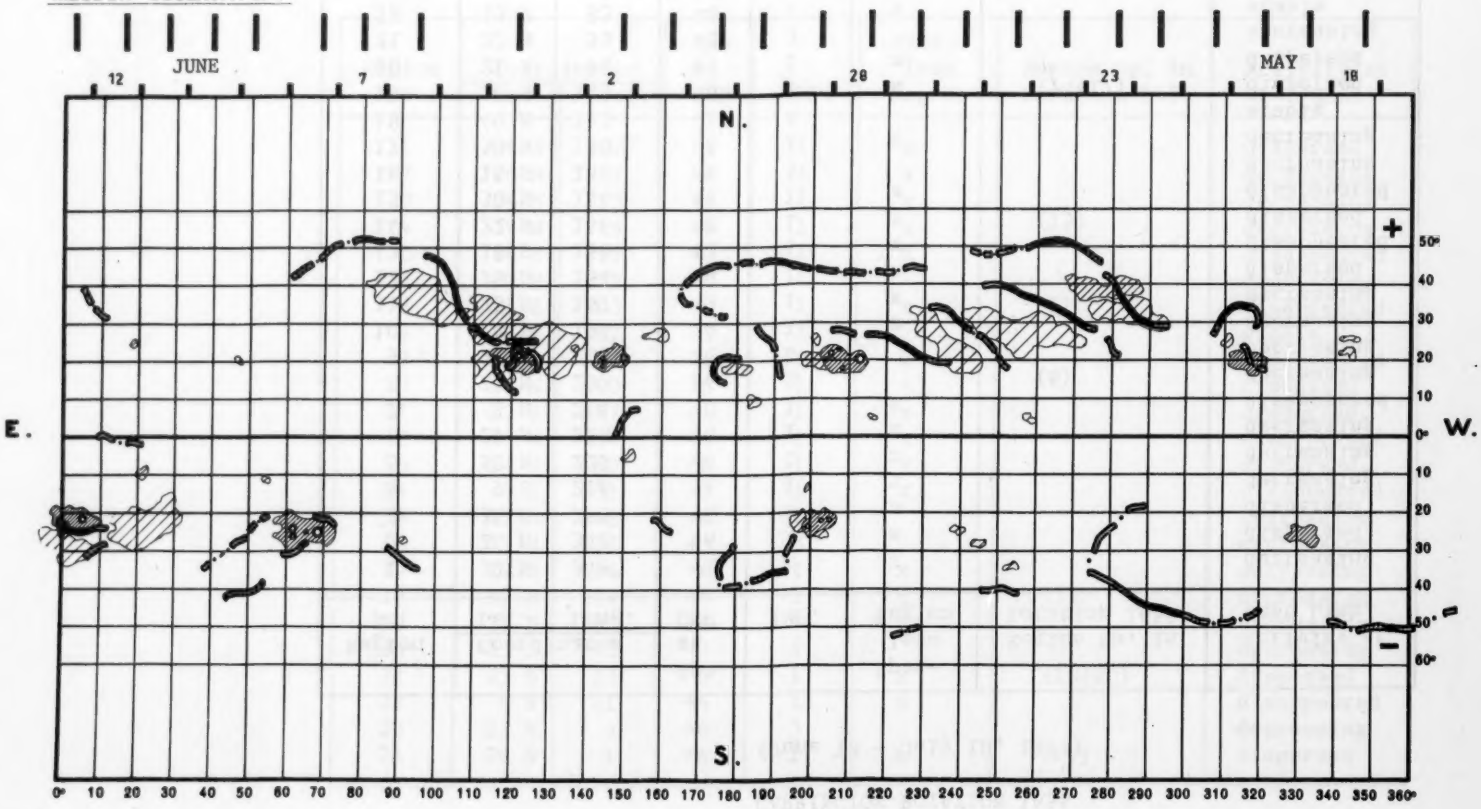
Region No.	Coordinates Lat.	Coordinates Long.	Age at CMP	IMP.	Spot-less Region	Region No. in Rotation 1655	Activity at West Limb
1	32°N	348°	+1	1	x		decreasing
2	26 N	342	>6	1	x		dispersed
3	31 N	253	>6	1	x		dispersed
4	9 S	228	>6	1	x		decreasing
5	32 N	229	-4	1	x		decreasing
6	27 N	223	>6	1	x		decreasing
7	3 N	214	0	1	x		disappeared
8	22 N	209	>6	2		(6)	decreasing
9	22 S	205	>6	4			decreasing
10	24 S	196	>6	1	x		decreasing
11	25 S	157	-3	1	x		decreasing
12	28 N	154	>6	1	x		dispersed
13	18 S	150	+2	1	x		disappeared
14	22 N	146	>6	1	x	(15)	dispersed
15	30 N	144	+6	1	x		disappeared
16	16 N	142	>6	5			decreasing
17	30 N	140	>6	1	x		decreasing
18	40 N	133	-1	4			stable
19	20 N	123	>6	1	x	(16+17)	dispersed
20	21 N	94	+4	1	x		dispersed
21	22 N	93	-2	3			increasing
22	23 N	65	-4	1	x		stable
23	26 S	58	>6	1	x	(20)	dispersed
24	28 S	58	-2	1	x		decreasing
25	21 N	31	-2	1	x		increasing
26	18 N	27	>6	2			decreasing
27	21 S	0	>6	2		(23)	decreasing

SYNOPTIC SOLAR MAP

CARRINGTON ROTATION 1655

MAY 17 TO JUNE 13, 1977

MEUDON OBSERVATORY

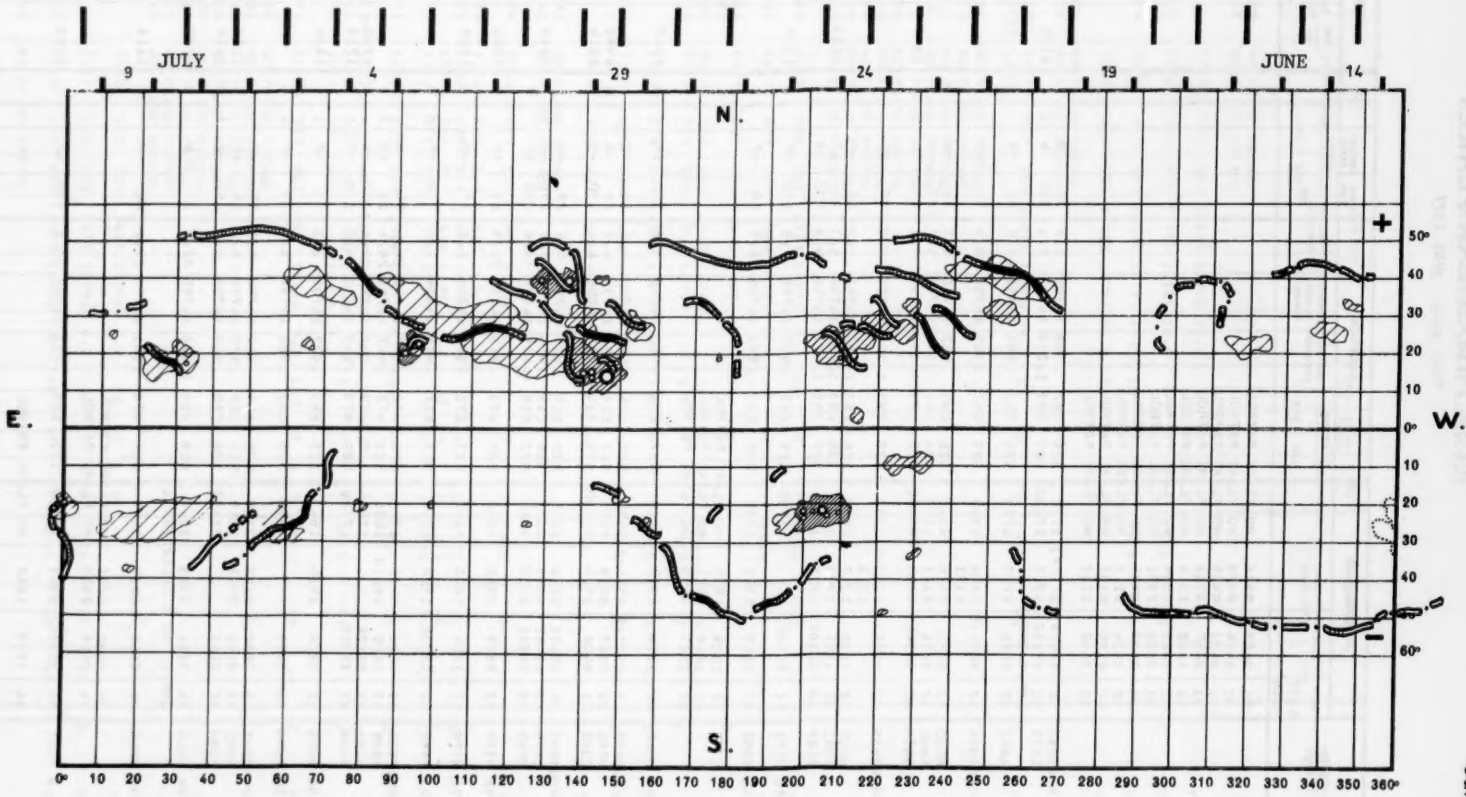


SYNOPTIC SOLAR MAP

CARRINGTON ROTATION 1656

JUNE 13 - JULY 10, 1977

MEUDON OBSERVATORY



7
Jun 77

Hα SOLAR FLARES

JUNE 1977

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE 1977 JUN	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		CONF.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
	01	0403	0406	NO FLARE PATROL														
	01	0424	0429	NO FLARE PATROL														
	01	0430	0435	NO FLARE PATROL														
	01	0457	0500	NO FLARE PATROL														
	01	1820	1914	NO FLARE PATROL														
	01	1928	1954	NO FLARE PATROL														
	01	2000	2051	NO FLARE PATROL														
	01	2123	2205	NO FLARE PATROL														
	02	0024	0112	NO FLARE PATROL														
	02	0116	0137	NO FLARE PATROL														
	02	0143	0157	NO FLARE PATROL														
GRP63983	02	0715+1	0717+3	0738	S24	E87	.999	14796	8.8	23	N						A	
CATA	02	0715E	0720	0725D	S25	E90	1.000	14796	9.1	10D	N	2		0715	140		A	
	IMP.	2 IMP.S																
KANZ	02	0716	0717	0738	S24	E85	.996	14796	8.7	22	-N		C				A	
GRP63984	02	0821+5	0826 0833	0845	S25	E87	.999	14796	8.9	24	-N						AK	
HEUD	02	0821	0826	0840	S26	E85	.997	14796	8.7	19	-N		C				T	
KANZ	02	0826	0833	1146	S24	E85	.996	14796	8.7	200	-N		C				TK	
CATA	02	0830E	0840	0845D	S26	E90	1.000	14796	9.1	15D	1N	2		0840	129		A	
GRP63985	02	1155>9	1210+5 1223	1230	S26	E90	1.000	14796	9.2	35	1F							
HEUD	02	1155	1210	1230	S26	E89	1.000	14796	9.2	35	-F		C					
ZURI	02	1207	1223	1231	S25	E90	1.000	14796	9.3	24	1F		C	1223	60			
KIEV	02	1210E	1215	1230	S27	E90	1.000	14796	9.3	20D	1N		C					
986 HTPR	02	1246E		1353D	S25	E85	.997	14796	8.9	67D	-F		C	1328	50		E	Y5
987 KANZ	02	1515	1521	1534	S24	E83	.993	14796	8.9	19	-F		C					Y5
	02	1829	1939	NO FLARE PATROL														
	02	1948	2044	NO FLARE PATROL														
	02	2123	2155	NO FLARE PATROL														
988 CULG	02	2339	2345	0009	S27	E78	.982	14796	8.8	30	1N		C	2345	70			Y5
GRP63989	03	0907+1	0914+6	0935	N20	E16	.435	14794	4.6	28	-B				130	1.4	E	
HTPR	03	0907	0920	0935	N20	E19	.464	14794	4.8	28	-B		C	0920	130	1.3	E	
ZURI	03	0908	0914	0930D	N20	E14	.417	14794	4.4	22D	-B		P	0914	140	1.6		
GRP63990	03	0940E	0940	1005	N20	E16	.425	14794	4.5	25	-N							
CATA	03	0940E	0940	1000	N19	E15	.413	14794	4.5	20D	-N	2		0940	140	1.6		
KHAR	03	0950E	0950	1010	N22	E16	.459	14794	4.6	20D	-F		P				B	
991 HTPR	03	0949	0951	1002	N22	W73	.963	14785	28.9	13	-F		C	0951	20			Y5
992 HTPR	03	1004	1008	1021	S25	E72	.959	14796	8.8	17	-F		C	1008	20			Y5
993 RAMY	03	1233E	1238	1241	N23	E11	.435	14794	4.3	8D	-F	3	C		31		H R	Y5
GRP63994	03	1608	1621	1722	S22	W70	.947	14791	29.4	74	-N						E	
RAMY	03	1608	1621U	1636	S21	W70	.947	14791	29.4	28	-N	3	C		95		FOE	
HCMA	03	1610E		1755D	S22	W70	.947	14791	29.4	105D	-N		C	1700	50	1.8	E	
HUAN	03	1705E		1722D	S22	W70	.947	14791	29.5	17D	-F	1	P	1710	45		E	
995 HUAN	03	1834	1836	1843	S25	E65	.922	14796	8.6	9	-F	1	C	1836	40			Y5
996 HUAN	03	2030		2038	S25	E65	.922	14796	8.7	8	-F	1	C					Y5
GRP63997	03	2100>9	2102	2115	S25	E65	.922	14796	8.7	15	-F							
VORO	03	2100	2102	2114	S25	E65	.922	14796	8.8	14	-F		C	2102	72	1.8	E	
HUAN	03	2110		2115D	S26	E65	.924	14796	8.8	5D	-F	1	P	2114	25		D	
998 CULG	04	0021	0023	0048	N18	W90	1.000	14785	28.3	27	? N		C	0023	90			Y5
	IMP.	1 NO	PALE2	VORO1														
999 CULG	04	0112	0118	0158	S23	W78	.981	14791	29.2	46	-F		C	0118	35			Y5
	04	0641	0701	NO FLARE PATROL														
	04	0815	0828	NO FLARE PATROL														
0 MONT	04	0950E	0953	1009D	S22	W83	.993	14791	29.2	19D	-F		C	0953	20		D	Y5
	04	1009	1012	NO FLARE PATROL														

Hα SOLAR FLARES

JUNE 1977

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE 1977 JUN	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		CONG	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.		
	04	1023	1025	NO FLARE PATROL														
	04	1029	1112	NO FLARE PATROL														
1 HUAN	04	1337		1345D	N22	W90	1.000	14785	28.8	8D	-F	1	P					Y5
2 HUAN	04	1530	1533	1536	N18	W90	1.000	14785	28.9	6	-F	1	C	1533	20		D	Y5
3 HUAN	04	1621	1628	1633	N19	W90	1.000	14785	28.9	12	-F	1	C	1628	25			Y5
4 HUAN	04	1643		1655	N20	W90	1.000	14785	28.9	12	-F	1	C					Y5
	04	1916	1934	NO FLARE PATROL														
	04	2137	2222	NO FLARE PATROL														
5 MITK	04	2352	2355	0011	N18	W90	1.000	14785	29.2	19	PN		C	2355	80		E	Y5
	IMP>1 NO > PALE2 CULG1																	
	05	1509	1531	NO FLARE PATROL														
	05	1547	1610	NO FLARE PATROL														
	05	1654	1720	NO FLARE PATROL														
	05	1728	1731	NO FLARE PATROL														
	05	1931	2021	NO FLARE PATROL														
	05	2033	2050	NO FLARE PATROL														
	05	2054	2105	NO FLARE PATROL														
	05	2108	2111	NO FLARE PATROL														
	05	2116	2119	NO FLARE PATROL														
	05	2126	2210	NO FLARE PATROL														
6 CULG	06	0002	0026	0053	S28	E37	.708	14796	8.8	51	-F		C	0026	25	.4		Y5
7 CATA	06	0835	0835	0840	N23	W50	.807	14799	2.6	5	-N	1		0835	56	.9		Y5
GRP64008	06	0850	0855 0903	0915	S22	E24	.531	14796	8.2	25	-N						E	
CATA	06	0850	0855	0910	S24	E23	.540	14796	8.1	20	-N	2		0855	112	1.3		
BUCA	06	0902E	0903	0919	S21	E26	.543	14796	8.3	17D	-F		P	0903	63	.8	E	
9 BUCA	06	1255		1305D	S24	E35	.663	14796	9.2	10D	-F		C	1305	15	.2	D	Y5
10 BUCA	06	1312	1313	1320	S24	E35	.663	14796	9.2	8	-N		C	1313	15	.2	D	Y5
11 WEND	06	1332		1355	N20	W36	.650	14794	3.9	23	-N							Y5
	06	2036	2039	NO FLARE PATROL														
	06	2115	2142	NO FLARE PATROL														
12 HTPR	07	0631	0634	0651	S23	E18	.484	14796	8.6	20	-F		C	0634	10	.1		Y5
GRP64013	07	1320+1	1323	1330	S25	E18	.507	14796	8.9	10	-N				40	.5	E	
HTPR	07	1320	1323	1328	S25	E16	.491	14796	8.8	8	-N		C	1323	50	.5	E	
MCMA	07	1321		1323D	S25	E17	.499	14796	8.8	2D	-N		C	1323	40	.5	E	
BUCA	07	1324E		1332	S25	E20	.524	14796	9.1	8D	-N		C	1324	34	.4	GE	
14 HUAN	07	1345	1357	1405D	N22	W70	.948	14799	2.3	20D	-F	1	P	1357	25		D	Y5
GRP64015	07	1503>9	1516+2	1522	N21	W69	.942	14799	2.5	19	-F						E	
HTPR	07	1503	1516	1522	N22	W68	.938	14799	2.5	19	-F		C	1516	50		E	
KANZ	07	1514	1518	1522	N21	W70	.948	14799	2.4	8	-N		P					
16 HUAN	07	2125	2129	2135D	S25	E12	.463	14796	8.8	10D	-F	1	P	2129	30	.3	E	Y5
	08	1648	1655	NO FLARE PATROL														
	08	1700	1704	NO FLARE PATROL														
	08	1711	1712	NO FLARE PATROL														
	08	1814	1816	NO FLARE PATROL														
	08	1827	1902	NO FLARE PATROL														
	08	1916	1923	NO FLARE PATROL														
	08	1947	2002	NO FLARE PATROL														
	08	2022	2030	NO FLARE PATROL														
17 HUAN	08	2058		2102D	S23	W06	.405	14796	8.4	4D	-F	1	P					Y5
18 HUAN	08	2137E		2143	S24	W05	.417	14796	8.5	6D	-F	1	P	2139	35	.4	E	Y5
19 CULG	08	2238	2245	2318	S29	E60	.900	14801	13.4	40	-F		C	2245	30	.8		Y5
	09	0145	0146	NO FLARE PATROL														

Hα SOLAR FLARES

JUNE 1977

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE 1977 JUN	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		CONC	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
GRP64020	09	1233+4	1237+1	1247	S27	W16	.520	14796	8.3	14	-N				30	.4	E
HUAN	09	1233	1238	1246	S26	W16	.507	14796	8.3	13	-N	1	C	1238	30	.4	E
MCMA	09	1233	1237	1250	S27	W16	.520	14796	8.3	17	-N		C	1237	30	.4	E
KANZ	09	1237	1237	1247	S27	W15	.513	14796	8.4	10	-N		C				D
GRP64021	09	1826+0	1828	1845	S26	W19	.531	14796	8.3	19	-N						EH
MCMA	09	1826E		1838D	S26	W20	.539	14796	8.3	12D	-N		P	1837	40	.5	EH
HUAN	09	1826	1828	1845	S26	W19	.531	14796	8.3	19	-N	1	C	1828	120	1.4	E
GRP64022	09	1943+5	2016	2035	S23	E47	.780	14801	13.3	52	-N						
HUAN	09	1943E		2000D	S24	E47	.784	14801	13.3	17D	-F	1	P	1954	30	.4	D
MCMA	09	1948	2016	2035	S23	E48	.789	14801	13.4	47	-N		C	2016	50	.8	E
	09	2134	2201	NO FLARE PATROL													
GRP64023	10	0747+3	0752+4	0806	S24	E44	.756	14801	13.6	19	-F						E
KANZ	10	0747	0756	0811	S24	E44	.756	14801	13.6	24	-N		C				E
MONT	10	0750	0752	0800	S24	E44	.756	14801	13.6	10	-F		C	0752	40		E
GRP64024	10	0845+1	0850+2 0858	0919	S25	E37	.693	14801	13.1	34	-F				60	.8	E
CATA	10	0845	0850	0940	S25	E36	.683	14801	13.1	55	-N	2		0850	140	1.9	
KANZ	10	0846	0851	0911	S25	E37	.693	14801	13.1	25	-F		C				E
ZURI	10	0846	0852	0908	S26	E37	.699	14801	13.1	22	-F		C	0852	60	.9	
MONT	10	0846	0858	0911	S25	E38	.703	14801	13.2	25	-N		C	0858	150		
BUCA	10	0850E		0935	S22	E36	.664	14801	13.1	45D	-F		C	0850	63	.9	CE
GRP64025	10	0935+5	0938+3	0950	S23	E41	.722	14801	13.5	15	-F				50	.7	E
CATA	10	0935	0940	0950	S24	E41	.727	14801	13.5	15	-N	2		0940	56	.8	
MONT	10	0937	0938	0950	S24	E43	.747	14801	13.6	13	-F		C	0938	40		E
KANZ	10	0939	0939	0939D	S23	E40	.712	14801	13.4		-F		C				E
BUCA	10	0940	0941	1006	S22	E41	.717	14801	13.5	26	-N		C	0941	47	.7	E
26 BUCA	10	1105	1124	1128	S23	W23	.535	14796	8.7	23	-F		C	1124	15	.2	D Y5
27 HUAN	10	1625		1645	S20	E33	.619	14801	13.2	20	-F	1	C	1637	20	.2	D Y5
GRP64028	11	0605+2	0605+4	0620	S23	E28	.588	14801	13.4	15	-N				90	1.1	
CATA	11	0605E	0605	0620D	S23	E30	.608	14801	13.5	15D	-N	2		0605	112	1.4	
ATHN	11	0607	0609	0620	S24	E27	.586	14801	13.3	13	-N	1			66		
	11	1700	2230	NO FLARE PATROL													
29 CATA	12	0555E	0555	0700	S23	E17	.463	14801	13.5	65D	-N	2		0555	112	1.3	Y5
GRP64030	12	0745+3	0750+4 0800	0819	S24	E07	.431	14801	12.8	34	-N						D
CATA	12	0745E	0800	0845	S24	E08	.436	14801	12.9	60D	-N	2		0800	56	.6	
KANZ	12	0745	0754	0819	S24	E07	.431	14801	12.8	34	-F		P				D
ATHN	12	0748	0750	0806	S24	E07	.431	14801	12.9	18	-N	1			33		
31 WEND	12 IMP. 1 NO. HUAN2 PALE2	1722		1740	S20	W22	.498	14796	11.1	18	?N						Y5
	12	1916	1922	NO FLARE PATROL													
	12	1926	1959	NO FLARE PATROL													
	12	2304	2312	NO FLARE PATROL													
GRP64032	13	0354>9	0408+1 0415+1	0517	S20	E04	.360	14801	13.5	83	-N				140	1.5	
MITK	13	0354	0409	0539D	S20	E03	.358	14801	13.4	105D	-B		C	0409	110	1.2	E
CULG	13	0358E	0416	0512D	S21	E05	.379	14801	13.5	74D	-N		C	0416	80	.9	
TEHR	13	0400	0415	0521	S18	E06	.337	14801	13.6	81	-N	9	C		190		DE
TACH	13	0404	0408	0503	S22	E03	.390	14801	13.4	59	-B		C	0410	179	2.0	F
33 CATA	13	0605E	0605	0640D	S21	E03	.374	14801	13.5	35D	-N	2		0605	112	1.2	Y5
	13	1524	1653	NO FLARE PATROL													
	13	1741	1816	NO FLARE PATROL													
	13	1824	1853	NO FLARE PATROL													
	13	1953	2025	NO FLARE PATROL													
	13	2033	2149	NO FLARE PATROL													
	13	2332	2343	NO FLARE PATROL													
	13	2345	2348	NO FLARE PATROL													
	13	2353	2358	NO FLARE PATROL													

Hα SOLAR FLARES

JUNE 1977

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE 1977 JUN	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	MIN.		CONF	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
GRP64034	14	1305+2	1309	1317	S22	W19	.492	14801	13.1	12	-F				25	.3	E
MCMA	14	1305E		1317D	S23	W19	.503	14801	13.1	120	-F		P	1306	30	.3	E
HTPR	14	1307	1309	1317	S22	W20	.501	14801	13.0	10	-F		C	1309	20	.2	
	14	1903	1918	NO FLARE PATROL													
	14	1940	1952	NO FLARE PATROL													
	14	1958	2020	NO FLARE PATROL													
	14	2055	2146	NO FLARE PATROL													
	14	2258	2303	NO FLARE PATROL													
35 HTPR	15	0822	0824	0847	S23	W31	.623	14801	13.0	25	-F		C	0824	10	.1	Y5
36 HTPR	15	1507	1510	1520	S23	W27	.582	14801	13.6	13	-F		C	1510	10	.1	Y5
37 MCMA	15	1520E		1630D	S23	W34	.654	14801	13.1	70D	-N		C	1535	40	.5	ELT Y5
	16	2154	2235	NO FLARE PATROL													
	17	0057	0108	NO FLARE PATROL													
GRP64038	17	0638		0707D	S09	E87	.999	14814	23.8	29	-F						D
HTPR	17	0638	0722	0750	S09	E85	.997	14814	23.7	72	-F		C	0722	20		
MONT	17	0657E	0657	0707	S10	E90	1.000	14814	24.0	10D	-F		C	0657	20		D
GRP64039	17	1042+3	1049+9	1116	S22	W53	.835	14801	13.5	34	1N				140	2.5	E
MONT	17	1042	1052	1126D	S22	W53	.835	14801	13.5	44D	-N		C	1052	180		
KANZ	17	1042	1052	1103	S23	W53	.838	14801	13.5	21	-N		P				E
ZURI	17	1044	1050	1112	S22	W53	.835	14801	13.5	28	-B		C	1050	60	1.2	
HTPR	17	1045	1049	1110	S23	W54	.846	14801	13.4	25	1N		C	1049	150	2.5	E
ATHN	17	1055E	1055	1114	S18	W56	.851	14801	13.3	19D	-N	1			98		
RAMY	17	1055E	1058U	1120	S21	W55	.849	14801	13.3	25D	-F	1	C		159		F
KHAR	17	1100E	1100	1113	S23	W52	.830	14801	13.6	13D	1F		P				E
CATA	17	1105E	1105	1130	S23	W52	.830	14801	13.6	25D	-F	2		1105	84	1.5	
40 KANZ	17	1414	1424	1429	N25	E90	1.000	14813	24.3	15	-N		C				Y5
41 KANZ	17	1516	1528	1531	N25	E90	1.000	14813	24.4	15	-N		C				Y5
	17	2120	2132	NO FLARE PATROL													
	17	2146	2155	NO FLARE PATROL													
	17	2158	2219	NO FLARE PATROL													
	17	2258	0030	NO FLARE PATROL													
	18	0050	0054	NO FLARE PATROL													
	18	0106	0230	NO FLARE PATROL													
	18	0545	0551	NO FLARE PATROL													
GRP64042	18	0835	0837	0845	S21	W64	.916	14801	13.6	10	-F						D
MONT	18	0835	0837	0845	S22	W64	.918	14801	13.6	10	-F		C	0837	20		D
KANZ	18	0844E	0844	0844D	S21	W65	.923	14801	13.5		-N		C				D
GRP64043	18	0947+6	0957 1005	1013	S21	W65	.923	14801	13.5	26	-F						D
MONT	18	0947	0957	1013	S22	W65	.924	14801	13.5	26	-F		C	0957	20		D
HTPR	18	0952	1005	1009	S21	W72	.960	14801	13.0	17	-F		C	1005	20	.4	
WEND	18	0953		1014	S21	W65	.923	14801	13.5	21	-N						
GRP64044	18	0957>9	1030 1046	1110	S20	E90	1.000	14815	25.2	73	-F						OK
MONT	18	0957	1030	1115D	S21	E90	1.000	14815	25.2	78D	-F		C	1030	20		OK
KANZ	18	1027	1046	1105	S20	E90	1.000	14815	25.2	38	-N		C				
45 HTPR	18	1453E		1458D	S21	W73	.964	14801	13.1	5D	-F		C	1454	10	.2	Y5
46 KANZ	18	1518	1518	1533	S21	W74	.969	14801	13.1	15	-F		C				E Y5
	18	2115	2144	NO FLARE PATROL													
	18	2212	2227	NO FLARE PATROL													
47 HUAN	19	1942		1953	S30	E78	.986	14815	25.7	11	-F	1	C				Y5
48 HUAN	19	2146	2150	2157	N24	E72	.956	14813	25.3	11	-F	1	C	2150	25		D Y5
49 MONT	20	0808	0811	0822	N25	E57	.863	14813	24.6	14	-F		C	0811	20		D Y5
	20	2158	2205	NO FLARE PATROL													
	21	0021	0025	NO FLARE PATROL													
	21	0032	0050	NO FLARE PATROL													
	21	0149	0204	NO FLARE PATROL													

Hα SOLAR FLARES

JUNE 1977

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE 1977 JUN	START	MAX. PHASE	END	APPROX LAT.	APPROX LONG. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	MIN.		CONF.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
	21	0206	0229	NO FLARE PATROL														
	21	0234	0316	NO FLARE PATROL														
50 CATA	21	0730	0730	0730D	S23	E54	.849	14815	25.4		-N	2		0730	28	.5		Y5
51 KANZ	21	0732	0732	0732D	S23	E57	.872	14815	25.6		-F		P				D	Y5
	21	2143	2201	NO FLARE PATROL														
	21	2230	2235	NO FLARE PATROL														
	21	2236	2255	NO FLARE PATROL														
	22	0002	0050	NO FLARE PATROL														
	22	0158	0219	NO FLARE PATROL														
52 HUAN	22	1518	1522	1523	N16	E90	1.000	14822	29.4	5	-F	1	C	1522	20		D	Y5
53 HUAN	22	1857	1858	1900	N11	E90	1.000	14822	29.5	3	-F	1	C	1859	40			Y5
54 HUAN	22	1923		1933	N12	E90	1.000	14822	29.6	10	-F	1	C	1930	40		E	Y5
55 HUAN	22	1951	1957	1957	N16	E88	.999	14822	29.4	6	-F	1	C	1957	30			Y5
56 HUAN	22	2018	2020	2025	N14	E90	1.000	14822	29.6	7	-F	1	C	2020	20		D	Y5
	22	2046	2050	NO FLARE PATROL														
	22	2211	2236	NO FLARE PATROL														
	23	0115	0140	NO FLARE PATROL														
57 CATA	23	0650	0650	0705D	S21	E31	.616	14815	25.6	150	-N	2		0650	28	.3		Y5
58 HTPR	23	0755		0759D	N14	E86	.997	14822	29.8	40	-F		C	0756	20			Y5
GRP64059	23	1032	1051 1102	1149	N21	E21	.469	14813	25.0	77	-F				70	.8	E	
MONT	23	1032	1102	1120D	N21	E21	.469	14813	25.0	480	-F		C	1102	40		E	
ZURI	23	1035E	1051	1149	N21	E21	.469	14813	25.0	740	-F		P	1051	80	1.0		
HTPR	23	1041E		1112D	N22	E22	.498	14813	25.1	310	-F		C	1053	60	.6	E	
60 HUAN	23	1411	1412	1417	S27	E24	.602	14815	25.4	6	-F	1	C	1412	35	.4		Y5
61 HUAN	23	1426	1428	1435	N20	E20	.448	14813	25.1	9	-F	2	C	1428	35	.4	E	Y5
62 HUAN	23	1540	1543	1551	N26	E12	.449	14813	24.6	11	-F	2	C	1543	50	.6	E	Y5
63 HUAN	23	1611		1616	N24	E07	.392	14813	24.2	5	-F	1	C					Y5
64 HUAN	23	1613		1631	N13	E85	.996	14822	30.1	18	-N	1	C	1617	20		DT	Y5
65 HUAN	23	1634		1649	N13	E85	.996	14822	30.1	15	-F	1	C					Y5
GRP64066	23	1710+8	1723	1731	S24	E27	.600	14815	25.7	21	-N				35	.4	EH	
MCMA	23	1710		1724D	S24	E28	.610	14815	25.8	140	-N		C	1723	30	.4	EH	
HUAN	23	1718	1723	1731	S24	E27	.600	14815	25.7	13	-N	2	C	1723	40	.5		
67 HUAN	23	1727		1734	N13	E85	.996	14822	30.1	7	-F	1	C					Y5
68 HUAN	23	1747	1750	1752	N13	E85	.996	14822	30.1	5	-F	1	C	1750	20		D	Y5
GRP64069	23	1824+1	1833+2	1903	N13	E86	.997	14822	30.2	39	-N						EL	
HUAN	23	1824	1835	1903	N13	E85	.996	14822	30.1	39	-B	1	C	1835	50		E	
MCMA	23	1825	1833	1838D	N14	E86	.999	14822	30.4	130	-N		C	1833			EL	
70 HUAN	23	1921		2005	N13	E85	.996	14822	30.2	44	-F	1	C					Y5
71 HUAN	23	1943	1954	2005	S26	E26	.610	14815	25.8	22	-F	2	C	1954	20	.2	D	Y5
72 HUAN	23	2029	2050	2106	N13	E83	.992	14822	30.1	37	-N	1	C	2050	35			Y5
73 HUAN	23	2111	2112	2122	S24	E26	.591	14815	25.8	11	-N	2	C	2112	35	.4	E	Y5
74 HUAN	23	2200	2208	2213	N13	E82	.990	14822	30.1	13	-N	1	C	2208	40			Y5
	23	2208	2211	NO FLARE PATROL														
	23	2217	2232	NO FLARE PATROL														
	23	2240	2316	NO FLARE PATROL														
	23	2323	2330	NO FLARE PATROL														
75 MANI	23	2359E	2402	0020	N16	E77	.974	14822	29.8	210	-N		P	2402	70	1.8		Y5

Hα SOLAR FLARES

JUNE 1977

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE 1977 JUN	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		CONG	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
	24	0130	0140	NO FLARE PATROL													
	24	0150	0152	NO FLARE PATROL													
76 TACH	24	0340	0347	0353	N14	E78	.978	14822	30.0	13	1N		C	0345	176		Y5
GRP64077	24	0613+2	0613+2	0624	N14	E73	.956	14822	29.7	11	-N				80		
ATHN	24	0613E	0613	0622	N14	E72	.951	14822	29.7	90	-N	1			98		
CATA	24	0615	0615	0625	N15	E74	.961	14822	29.8	10	-B	2		0615	56		
78 HTPR	24	0637	0637	0644	S23	E24	.563	14815	26.1	7	-F		C	0637	40	.4	E Y5
GRP64079	24	0652+2	0701	0706	N14	E73	.956	14822	29.8	14	-F				25		D
HTPR	24	0652		0706D	N14	E70	.940	14822	29.5	140	-F		C	0701	30		
MONT	24	0654	0701	0705	N14	E76	.970	14822	30.0	11	-F		C	0701	20		D
GRP64080	24	0734+6	0742+3	0750	N14	E73	.956	14822	29.8	16	1N				90		
MONT	24	0734	0742	0751	N14	E76	.970	14822	30.0	17	-N		C	0742	60		
HTPR	24	0735	0742	0746	N14	E70	.940	14822	29.6	11	-B		C	0742	100		
CATA	24	0740	0745	0750	N15	E73	.957	14822	29.8	10	1N	2		0745	112		
GRP64081	24	0800+1	0817 0826	0926	N15	E75	.966	14822	30.0	86	-F						EK
HTPR	24	0800	0817	0925	N15	E75	.966	14822	30.0	85	-N		C	0817	50	1.0	E
MONT	24	0801	0826	0926	N15	E76	.970	14822	30.0	85	-F		C	0826	60		EK
GRP64082	24	0830+4	0833+0 0838	0840	S22	E12	.450	14815	25.3	10	-F				35	.4	
MONT	24	0830	0833	0839	S22	E12	.450	14815	25.3	9	-F		C	0833	40		
HTPR	24	0831	0833	0840	S22	E12	.450	14815	25.3	9	-F		C	0833	30	.3	
KANZ	24	0834	0838	0842	S23	E11	.458	14815	25.2	8	-N		P				B
GRP64083	24	0909	0924	0933	S22	E11	.444	14815	25.2	24	-F						
MONT	24	0909	0924	0931	S22	E12	.450	14815	25.3	22	-F		C	0924	40		
CATA	24	0915E	0915	0935D	S23	E11	.458	14815	25.2	200	-N	2		0915	84	.9	
GRP64084	24	0930+8	0934 0942	0945	N14	E72	.951	14822	29.8	15	-N				50		E
LOCA	24	0930	0934	0945	N16	E73	.957	14822	29.9	15	-N		V	0934	51	1.9	
MONT	24	0937	0942	0945	N15	E75	.966	14822	30.0	8	-N		C	0942	60		E
HTPR	24	0938		0943D	N13	E70	.940	14822	29.7	50	-B		C	0939	40	.8	
CATA	24	0940E	0945	0950	N13	E71	.946	14822	29.7	100	-N	2		0945	56		
GRP64085	24	0956+4	0957+3	1004	S22	E10	.438	14815	25.2	8	-N				50	.6	D
MONT	24	0956	0959	1002	S22	E11	.444	14815	25.2	6	-F		C	0959	40		D
ZURI	24	0957	0957	0959D	S22	E10	.438	14815	25.2	20	-N		P	0957	60	.7	
CATA	24	1000	1000	1005	S23	E10	.452	14815	25.2	5	-N	2		1000	56	.6	
86 MONT	24	1006	1007	1010	N15	E75	.966	14822	30.0	4	-F		C	1007	20		D Y5
87 ZURI	24	1026	1027	1028	S22	E10	.438	14815	25.2	2	-F		C	1027	60	.7	Y5
GRP64088	24	1123+2	1126+7	1138	N15	E73	.957	14822	29.9	15	-N				60		D
MONT	24	1123	1126	1130D	N15	E75	.966	14822	30.1	70	-F		C	1126	20		D
ZURI	24	1125	1133	1135	N15	E72	.952	14822	29.9	10	-N		C	1133	60		
CATA	24	1130E	1130	1140D	N14	E72	.951	14822	29.9	100	-N	2		1130	56		
GRP64089	24	1142>9	1208	1214D	N13	E71	.946	14822	29.8	32	-F						D
LVOV	24	1142	1208	1302	N14	E71	.946	14822	29.8	80	1F		C	1208	100	2.7	D
HUAN	24	1209		1214	N13	E71	.946	14822	29.8	5	-F		C				
GRP64090	24	1230+0	1241 1253+3	1338	S23	E11	.458	14815	25.3	68	1F						EJKW
LVOV	24	1230	1256	1518	S22	E09	.432	14815	25.2	168	2F		C	1256	500	5.8	KJ
MCMA	24	1230	1241	1250D	S23	E08	.442	14815	25.1	200	-F		C	1241	50	.5	E
HUAN	24	1249	1253	1332	S24	E13	.484	14815	25.5	43	1F	2	C	1253	110	1.3	TW
HUAN	24	1249	1322	1332	S24	E13	.484	14815	25.5	43	1F		C	1322	22	2.6	
MCMA	24	1250	1253	1344D	S23	E12	.464	14815	25.4	540	-N		C	1253	60	.6	EW
ZURI	24	1251	1255	1311	S22	E10	.434	14815	25.3	20	-N		C	1255	150	1.8	
UPIC	24	1257E		1258D	S24	E11	.472	14815	25.4	10	-F		P	1258	82		
GRP64091	24	1309+0	1309+1	1312	N11	E69	.934	14822	29.7	3	-N				20		D
HUAN	24	1309	1310	1312	N11	E69	.934	14822	29.7	3	-F	1	C	1310	15		D
MCMA	24	1309	1309	1311	N12	E69	.934	14822	29.7	2	-B		P	1309	15	.5	D
92 HUAN	24	1352	1352	1359	S23	E08	.442	14822	25.2	7	-N	1	C	1352	40	.5	E Y5

Hα SOLAR FLARES

JUNE 1977

OBSERV-ATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS		MEASUREMENTS			REMARKS	
	DATE 1977 JUN	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR. DAY	MIN.		CONF.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.		
GRP64093	24	1405+4	1412+3	1423	S22	E08	.427	14815	25.2	18	-N						E	
HUAN	24	1405	1412	1423	S22	E07	.423	14815	25.1	18	-N	*	C	1412	65	.7	E	
ZURI	24	1409	1415	1415D	S22	E10	.438	14815	25.3	60	-N	*	P	1415	170	2.0		
94 HUAN	24	1438	1440	1447	N14	E75	.966	14822	30.2	9	-F	1	C	1440	40		E	Y5
GRP64095	24	1454+1	1456+2 1550	1554	S21	E07	.408	14815	25.1	60	-N				35	.4	E	
HUAN	24	1454	1456	1503	S23	E07	.438	14815	25.1	9	-N	*	C	1456	40	.5	E	
RAMY	24	1455	1458	1555	S21	E08	.412	14815	25.2	60	-N	*	C		32			
HUAN	24	1548	1550	1553	S22	E06	.419	14815	25.1	5	-F	*	C	1550	30	.3		
96 HUAN	24	1639	1640	1652	S23	E07	.438	14815	25.2	13	-F	1	C	1640	25	.3		Y5
97 HUAN	24	1710	1711	1712	S22	E05	.416	14815	25.1	2	-N	2	C	1711	40	.4	E	Y5
GRP64098	24	1719	1721	1929	S24	E05	.446	14815	25.1	130	-N						EL	
HUAN	24	1719	1721	1929	S23	E06	.434	14815	25.2	130	-F	2	C	1721	75	.8	E	
MCMA	24	1824E		1828D	S24	E05	.446	14815	25.1	40	-N		C	1827	125	1.4	EL	
MCMA	24	1903E		1905D	S24	E05	.446	14815	25.2	20	-N		P	1903	40	.4	E	
99 MCMA	24	1824E		1828D	N28	W05	.444	14813	24.4	40	-N		C	1827	25	.3	E	Y5
GRP64100	24	2023+1	2026	2034	N15	E67	.922	14822	29.9	11	-F							
RAMY	24	2023	2026	2033	N16	E67	.923	14822	29.9	10	-F	3	C		32			
HUAN	24	2024		2035	N14	E68	.928	14822	30.0	11	-F	1	C					
101 HUAN	24	2104		2125	N25	E55	.845	14819	29.0	21	-F	1	C				E	Y5
GRP64102	24	2202	2210+5	2219D	N15	E66	.916	14822	29.9	17	-F				50			
HUAN	24	2202	2210	2214D	N14	E67	.922	14822	29.9	120	-F	1	P	2210	40			
RAMY	24	2212E	2215	2219D	N16	E65	.909	14822	29.8	70	-N	2	C		64			
103 RAMY	24	2217	2219	2221D	S21	E05	.400	14815	25.3	40	-N	2	C		128		DE	Y5
104 CULG	24	2222	2253	0000	S23	E03	.426	14815	25.2	98	-N		C	2253	85	.9		Y5
105 CULG	25	0030	0031	0041	S23	E02	.426	14815	25.2	11	-F		C	0031	30	.3		Y5
	25	0217	0218	NO FLARE PATROL														
106 CULG	25	0246	0302	0314	S23	W01	.426	14815	25.0	28	-F		C	0302	30	.3		Y5
107 HTPR	25	0617E		0621D	N14	E60	.869	14822	29.8	40	-F		C	0618	10	.2		Y5
108 HTPR	25	0653	0655	0700	N14	E60	.869	14822	29.8	7	-F		C	0655	20	.4	E	Y5
GRP64109	25	0851+1	0851+1	0855D	N13	E59	.860	14822	29.8	4	-F						E	
HTPR	25	0851	0851	0855	N13	E59	.860	14822	29.8	4	-F		C	0851	20	.4	E	
KANZ	25	0852	0852	1152	N13	E60	.869	14822	29.9	180	-F		C				T	
GRP64110	25	1040+0	1042+3	1053	S22	W04	.414	14815	25.1	13	-N							
RAMY	25	1040E	1042	1049	S21	W05	.402	14815	25.1	90	-N	3	C•		159		FDE	
KANZ	25	1040	1043	1055	S22	W05	.417	14815	25.1	15	-N		C					
UPIC	25	1040E		1053	S23	W02	.426	14815	25.3	130	-F		P	1040	61			
UPIC	25	1040E	1045U	1053	S21	W04	.399	14815	25.1	130	-F		P	1045	61			
GRP64111	25	1052+6	1052 1059+3	1113	N15	E58	.853	14822	29.8	21	-N				90	1.8	KS	
ATHN	25	1052E	1052	1120	N22	E65	.914	14822	30.3	280	-N	*			114			
HTPR	25	1053E		1102D	N14	E58	.852	14822	29.8	90	-N	*	C	1054	30	.5	E	
UPIC	25	1053	1109	1115	N16	E58	.854	14822	29.8	22	-F	*	P	1109	41		K	
RAMY	25	1056	1059	1110D	N17	E58	.856	14822	29.8	140	-B	*	C		80		FDE	
TEHR	25	1058	1102	1108	N13	E57	.842	14822	29.7	10	-F	*	C		127		DE S	
112 HUAN	25	1239		1241	S20	W05	.386	14815	25.2	2	-F	1	C					Y5
GRP64113	25	1425+2	1429+5	1443	N15	E57	.845	14822	29.9	18	1N				130	2.4	Y	
RAMY	25	1425E	1429	1441D	N17	E56	.838	14822	29.8	160	-N	4	C		144		DE	
LVOV	25	1427	1434	1439	N14	E60	.869	14822	30.1	12	1F		C	1434	150	3.2	D	
MCMA	25	1434E		1447D	N15	E57	.845	14822	29.9	130	1B		P	1434	125	2.4	EY	
UPIC	25	1435E	1435U	1435D	N14	E57	.843	14822	29.9		-F		P	1435	82			
CATA	25	1438E	1438	1445D	N14	E57	.843	14822	29.9	70	-B	2		1438	56	1.0		
GRP64114	25	1458+3	1503+2	1509	N14	E58	.852	14822	30.0	11	-F				35	.7		
HUAN	25	1458	1503	1507	N14	E58	.852	14822	30.0	9	-N	1	C	1503	30	.6		
UPIC	25	1501	1505	1510U	N14	E59	.861	14822	30.1	90	-F		P	1505	41			

Hα SOLAR FLARES

JUNE 1977

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE 1977 JUN	START	MAX. PHASE	END	APPROX LAT.	APPROX LONG. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		CONG.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
115 MCMA	25	1543E		1608D	N16	E57	.846	14822	29.9	25D	-F		P	1543	30	.6	D Y5
	25	1905	1907	NO FLARE PATROL													
GRP64116	25	1952	1953	2002	N15	E55	.826	14822	30.0	10	-B						E
MCMA	25	1952	1953	2002	N16	E55	.828	14822	30.0	10	-B		C	1953	50	.9	E
HUAN	25	1958E		2001	N15	E55	.826	14822	30.0	3D	-F	1	P				
GRP64117	25	2015	2032+3	2050	S22	W11	.445	14815	25.0	35	-F						E
MCMA	25	2015	2032	2050	S22	W11	.445	14815	25.0	35	-F		C	2032	30	.3	E
RAMY	25	2031E	2035U	2038D	S22	W12	.452	14815	25.0	7D	-F	3	C		80		DE
GRP64118	25	2038	2040	2059	N16	E55	.828	14822	30.0	21	-B				80	1.4	
MCMA	25	2038	2040	2100	N16	E55	.828	14822	30.0	22	-B		C	2040	80	1.4	E
VORO	25	2044E		2058	N16	E56	.837	14822	30.1	14D	-B		C	2045	81	1.4	D
GRP64119	25	2102+1	2103+2	2111	N16	E55	.828	14822	30.0	9	-N				30	.5	D
VORO	25	2102	2103	2110	N16	E56	.837	14822	30.1	8	-B		C	2103	27	.4	D
MCMA	25	2103	2105	2112	N16	E55	.828	14822	30.0	9	-N		C	2105	25	.4	D
GRP64120	25	2119+1	2124+1	2133	N16	E55	.828	14822	30.0	14	-N				60	1.1	DJ
MCMA	25	2119	2124	2125D	N16	E55	.828	14822	30.0	6D	-B		P	2124	40	.7	D
VORO	25	2120	2125	2133	N16	E56	.837	14822	30.1	13	-F		C	2125	90	1.6	DJ
121 VORO	25	2151	2159	2211	N16	E56	.837	14822	30.1	20	-F		C	2159	10	1.9	J Y5
122 CULG	25	2329E	2329E	2340	N15	E51	.787	14822	29.8	11D	-N		P	2329	80	.9	Y5
	26	0029	0102	NO FLARE PATROL													
	26	0103	0110	NO FLARE PATROL													
	26	0120	0125	NO FLARE PATROL													
123 UPIC	26	0610E		0615D	S21	W15	.462	14815	25.1	5D	-F		P	0615	61		Y5
124 UPIC	26	0710	0720	0805D	N18	E48	.761	14822	29.9	55D	1F		P	0720	224		K Y5
125 KHAR	26	0913	0913	0925	N16	E48	.757	14822	30.0	12	-F		P				E Y5
GRP64126	26	1018+1	1021+0 1026	1043	N15	E44	.710	14822	29.7	25	1N				160	2.3	UZ
TEHR	26	1018	1021	1043	N14	E44	.707	14822	29.7	25	1N	4	C		286		U Z
ATHN	26	1019	1021	1030D	N20	E40	.680	14822	29.4	11D	-N	1			131		
RAMY	26	1024E	1026U	1038D	N15	E44	.710	14822	29.7	14D	-N	2	C		159		ZDE
127 MCMA	26	1110	1114	1230D	N15	E45	.721	14822	29.8	80D	-N		C	1114	60	.9	E Y5
128 MCMA	26	1243	1246	1248	N15	E43	.698	14822	29.8	5	-N		C	1246	40	.6	E Y5
129 MCMA	26	1304	1309	1335	N15	E45	.721	14822	29.9	31	-B		C	1309	50	.7	EF Y5
GRP64130	26	1334	1340+2	1405	S22	W16	.483	14815	25.4	31	2N				480	5.4	IJ
MCMA	26	1334	1340	1405	S23	W18	.512	14815	25.2	31	1B		C	1340	300	3.3	FI
RAMY	26	1336E	1341	1349D	S21	W16	.470	14815	25.4	13D	2N	4	C		891		FDE
HUAN	26	1337E		1404	S23	W16	.496	14815	25.4	27D	2N	1	P	1338	450	5.4	E
TEHR	26	1338E	1341	1357	S22	W13	.460	14815	25.6	19D	1N	3	C		477		DE
LVOV	26	1341E	1342	1414	S23	W17	.503	14815	25.3	33D	1N		C	1342	500	5.9	CJ
GRP64131	26	1407+1	1410+0	1412	N13	E44	.705	14822	29.9	5	-N				35	.5	D
MCMA	26	1407	1410	1412	N15	E45	.721	14822	30.0	5	-B		C	1410	25	.4	D
HUAN	26	1408	1410	1412	N12	E43	.691	14822	29.8	4	-N	1	C	1410	40	.6	
GRP64132	26	1422+7	1430 1438+1	1545	S22	W18	.500	14815	25.2	83	1N				340	3.9	HI
MCMA	26	1422	1438	1605	S23	W18	.512	14815	25.2	103	1B		C	1438	300	3.3	EFIH
LOCA	26	1424	1430	1545	S21	W18	.488	14815	25.3	81	2N		V	1430	611	7.3	
RAMY	26	1425E	1439	1443D	S21	W17	.479	14815	25.3	18D	1N	4	C		350		FDE
HUAN	26	1429	1439	1538	S23	W20	.529	14815	25.1	69	1N	1	C	1439	360	4.0	E
133 MCMA	26	1455	1456	1500	N15	E45	.721	14822	30.0	5	-N		C	1456	25	.4	D Y5
GRP64134	26	1507+2	1509+2	1530	N16	E44	.712	14822	29.9	23	-N				70	1.0	E
MCMA	26	1507	1511	1540	N17	E44	.715	14822	29.9	33	-B		C	1511	65	1.0	E
HUAN	26	1509	1509	1519	N15	E45	.721	14822	30.0	10	-N	1	C	1509	65	1.0	E

Hα SOLAR FLARES

JUNE 1977

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE 1977 JUN	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP DAY	MIN.		CONC	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
GRP64135	26	1546+2	1548+1	1552	N15	E44	.710	14822	30.0	6	-N				70	1.0	E
MCMA	26	1546	1548	1552	N14	E45	.719	14822	30.0	6	-B		C	1548	55	.8	E
HUAN	26	1548	1549	1552	N13	E46	.728	14822	30.1	4	-N	1	C	1549	55	.8	E
RAMY	26	1550E	1552U	1557	N17	E41	.680	14822	29.7	7D	-F	3	C		95		FDE
136 HUAN	26	1611	1613	1614	S22	W23	.546	14815	24.9	3	-F	1	C	1613	20	.2	D Y5
GRP64137	26	1623+0	1626+1	1632	N14	E44	.707	14822	30.0	9	-F				50	.7	E
HUAN	26	1623	1627	1632	N14	E45	.719	14822	30.1	9	-F	1	C	1627	55	.8	E
MCMA	26	1623	1626	1631	N14	E43	.695	14822	29.9	8	-N		C	1626	40	.6	E
GRP64138	26	1644+1	1648+1	1658	N13	E45	.717	14822	30.1	14	-N				50	.7	E
MCMA	26	1644	1648	1658D	N14	E45	.719	14822	30.1	14D	-B		C	1648	50	.7	E
HUAN	26	1645	1649	1658	N13	E46	.728	14822	30.1	13	-N	2	C	1649	50	.8	E
GRP64139	26	1709	1718+3	1727	N14	E44	.707	14822	30.0	18	-F				35	.5	E
MCMA	26	1709	1718	1725	N15	E43	.698	14822	29.9	16	-N		C	1718	40	.6	E
HUAN	26	1717E	1721	1729	N14	E45	.719	14822	30.1	12D	-F	1	P	1721	30	.4	
140 HUAN	26	1801		1805	N13	E42	.681	14822	29.9	4	-F	1	C				Y5
141 HUAN	26	1832	1832	1840	N14	E45	.719	14822	30.1	8	-F	1	C	1832	50	.7	Y5
142 HUAN	26	1849		1852	N15	E41	.674	14822	29.9	3	-F	1	C				Y5
143 HUAN	26	1947		1951	S22	W25	.566	14815	24.9	4	-F	1	C				Y5
144 HUAN	26	1956	1958	1959	N15	E43	.698	14822	30.1	3	-F	1	C	1958	30	.4	Y5
145 HUAN	26	2016	2018	2022	N13	E45	.717	14822	30.2	6	-F	1	C	2018	25	.4	D Y5
146 HUAN	26	2034		2037	S22	W22	.536	14815	25.2	3	-F	1	C				Y5
147 HUAN	26	2049		2102D	N15	E43	.698	14822	30.1	13D	-F	1	P				E Y5
GRP64148	26	2153	2154	2223	S23	W25	.575	14815	25.0	30	-N						E
CULG	26	2153	2154	2223	S24	W25	.585	14815	25.0	30	-N		C	2154	95	1.2	
HUAN	26	2207E		2212D	S22	W26	.576	14815	25.0	5D	-F	1	P				E
149 CULG	26	2215	2218	2239	N13	E40	.656	14822	29.9	24	-N		C	2218	65	.9	Y5
GRP64150	27	0127	0146	0205D	N14	E37	.620	14822	29.8	38	-N						E
CULG	27	0127	0146	0205	N13	E37	.617	14822	29.8	38	-N		C	0146	110	1.4	
VORO	27	0159E		0241	N16	E38	.640	14822	29.9	42D	1N		P	0201	170	2.2	E
151 HANI	27	0333E	0338U	0347	S22	W25	.567	14815	25.3	14D	-F		P	0338	50	.6	Y5
GRP64152	27	0418+2	0419+2	0436	S22	W24	.557	14815	25.4	18	-F						JRU
CULG	27	0352	0420	0504	S23	W25	.576	14815	25.3	72	-N		C	0420	135	1.8	J
PALE	27	0418	0419	0423	S22	W25	.567	14815	25.3	5	-F	2	C		57		U R
TACH	27	0420	0421	0436	S21	W23	.537	14815	25.5	16	1F		C	0423	309	3.9	
153 CULG	27	0420	0424	0450	N14	E36	.607	14822	29.9	30	-F		C	0424	75	1.0	Y5
GRP64154	27	0505	0529+0 0542	0600	N14	E36	.607	14822	29.9	55	1N				260	3.3	Z
CULG	27	0505	0529	0600	N13	E35	.591	14822	29.8	55	1N		C	0529	215	2.7	
KODA	27	0529E	0529	0544	N15	E37	.624	14822	30.0	15D	1B		P	0529	314	3.2	CE
TEHR	27	0531	0542	0601	N15	E35	.598	14822	29.9	30	1N	3	C		382		Z F
155 CULG	27	0525	0530	0545	S22	W25	.567	14815	25.4	20	-F		C	0530	30	.4	Y5
GRP64156	27	0600>9	0623 0628+2	0648	S22	W26	.577	14815	25.3	48	-F						E
CULG	27	0600	0630	0640D	S23	W25	.576	14815	25.4	40D	-F		C	0630	60	.8	
HTPR	27	0620	0623	0624	S20	W26	.558	14815	25.3	4	-N		C	0623	50	.6	
HTPR	27	0626	0628	0648	S22	W28	.597	14815	25.2	22	-F		C	0628	30	.3	E
157 MONT	27	0920	0932	0942	S22	W31	.628	14815	25.1	22	-F		C	0932	40		Y5
GRP64158	27	1000+1	1007 1014	1017	N17	E34	.594	14822	30.0	17	-F				35	.4	E
HTPR	27	1000		1009D	N18	E34	.599	14822	30.0	9D	-F		C	1006	30	.3	E
MONT	27	1001	1007	1016	N19	E34	.604	14822	30.0	15	-F		C	1007	40		E
KHAR	27	1013E		1013D	N16	E34	.590	14822	30.0		-F		C				D
MONT	27	1014	1014	1017	N15	E35	.598	14822	30.1	3	-F		C	1014	20		D

Hα SOLAR FLARES

JUNE 1977

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE 1977 JUN	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
GRP64159	27	1024	1026	1032	N12	E33	.560	14822	29.9	8	-F						D	
MONT	27	1024	1026	1032	N13	E33	.564	14822	29.9	8	-F		C	1026	20		D	
KHAR	27	1027E		1027D	N12	E33	.560	14822	29.9		-F		C				D	
160 HTPR	27	1130	1132	1135	N16	E35	.602	14822	30.1	5	-F		C	1132	10	.1		Y5
GRP64161	27	1144+6	1148+3	1200	N16	E34	.590	14822	30.0	16	-N				70	.9		
MCMA	27	1144	1150	1203	N15	E34	.585	14822	30.0	19	-B		C	1150	60	.7	E	
HTPR	27	1144		1155D	N16	E35	.602	14822	30.1	11D	-F		C	1149	40	.5		
KHAR	27	1145	1148	1155	N15	E33	.572	14822	30.0	10	-F		C	1148	110	1.4	D	
RAMY	27	1148	1151	1156	N17	E33	.581	14822	30.0	8	-N	4	C		80		FDE	
CATA	27	1150	1150	1205	N15	E33	.572	14822	30.0	15	-N	2		1150	56	.7		
GRP64162	27	1458+7	1510	1520	N14	E32	.554	14822	30.0	22	-N						E	
HUAN	27	1458		1518	N14	E31	.541	14822	29.9	20	-F	1	C				E	
MCMA	27	1505E		1538D	N15	E32	.559	14822	30.0	33D	-N		P	1518	60	.7	E	
CATA	27	1505	1510	1520D	N14	E32	.554	14822	30.0	15D	-N	2		1510	112	1.3		
GRP64163	27	1539+1	1544 1555+1	1605	N15	E30	.532	14822	29.9	26	-N						E	
HUAN	27	1539		1549	N14	E30	.527	14822	29.9	10	-F	1	C				E	
RAMY	27	1540	1555	1615	N16	E29	.524	14822	29.8	35	-N	4	C		140		F	
MCMA	27	1541E	1544	1558D	N15	E30	.532	14822	29.9	17D	-N		C	1544	70	.8	E	
KANZ	27	1550	1556	1611	N14	E32	.554	14822	30.1	21	-N		C				E	
GRP64164	27	1656+1	1659 1705+2	1720	S21	W34	.652	14815	25.2	24	-F				45	.6	E	
MCMA	27	1656E	1705	1725	S22	W33	.648	14815	25.2	29D	-N		C	1705	60	.7	E	
HUAN	27	1657	1705	1720	S21	W36	.673	14815	25.0	23	-F	1	C				E	
HTPR	27	1657	1659	1705	S21	W33	.641	14815	25.2	8	-F		C	1659	20	.2		
HTPR	27	1700	1707	1719	S21	W35	.662	14815	25.1	19	-F		C	1707	30	.3		
HTPR	27	1700	1703	1713	S23	W28	.606	14815	25.6	13	-F		C	1703	10	.1		
165 HTPR	27	1739	1739	1744	N16	E31	.551	14822	30.1	5	-F		C	1739	20	.2	E	Y5
GRP64166	27	1851+0	1854	1900	N14	E29	.514	14822	30.0	9	-F						E	
HUAN	27	1851	1854	1900	N14	E28	.500	14822	29.9	9	-F	1	C				E	
MCMA	27	1851		1852D	N15	E30	.532	14822	30.0	1D	-N		P	1852	40	.5	E	
	27	2102	2146	NO FLARE PATROL														
GRP64167	27	2146E		2330	N21	W37	.650	14813	25.1	104	1F				200	2.7	E	
HUAN	27	2146E		2222D	N22	W37	.655	14813	25.1	36D	1F	1	P	2149	170	2.3	E	
CULG	27	2147E	2147E	2330	N21	W38	.661	14813	25.1	103D	1N		P	2147	240	3.4		
168 CULG	27	2323	2324	2340	N13	E25	.453	14822	29.8	17	-F		C	2324	25	.3		Y5
169 CULG	27	2330E	2331	2343	S22	W40	.720	14815	25.0	13D	-F		P	2331	50	.7		Y5
GRP64170	27	2347	0012+1	0028	N14	E25	.458	14822	29.9	41	-N				70	.8		
MANI	28	0003E	0013	0023D	N15	E26	.477	14822	30.0	20D	-N		P	0013	80	.9		
CULG	27	2347	2412	0028	N14	E25	.458	14822	29.9	41	-N		C	2412	60	.7		
171 CULG	27	2356	2413	0245	N30	W45	.774	14813	24.6	169	-F		C	2413	60	1.0		Y5
172 CULG	28	0238E	0242	0440	N15	E24	.450	14822	29.9	122D	-F		P.	0242	60	.7	KF	Y5
173 CULG	28	0339	0407	0510	S22	W37	.690	14815	25.4	91	-N		C	0407	110	1.5	F	Y5
174 HTPR	28	0619	0620	0621	N16	E23	.444	14822	30.0	2	-F		C	0620	10	.1		Y5
GRP64175	28	0713+1	0721+3	0742	S21	W40	.715	14815	25.3	29	-F						E	
HTPR	28	0713	0721	0740	S20	W40	.710	14815	25.3	27	-F		C	0721	40	.5		
MONT	28	0714	0724	0743	S22	W40	.721	14815	25.3	29	-N		C	0724	110		E	
GRP64176	28	0819+1	0825 0832	0853	N15	E21	.410	14822	29.9	34	-F						E	
MONT	28	0819	0825	0852	N15	E21	.410	14822	29.9	33	-F		C	0825	40		E	
HTPR	28	0820	0832	0853	N15	E22	.423	14822	30.0	33	-F		C	0832	30	.3	E	
177 RAMY	28	1250E	1258	1303	N16	E19	.392	14822	30.0	13D	-N	3	C		160		DE	Y5
GRP64178	28	1518+1	1520+5	1534	S21	W47	.784	14815	25.1	16	-F				40	.6	E	
HTPR	28	1518	1520	1534	S20	W46	.771	14815	25.2	16	-F		C	1534	30	.4	E	
HUAN	28	1519	1520	1548	S20	W48	.790	14815	25.0	29	-F	2	C	1520	35	.6	E	
MCMA	28	1519	1525	1534	S22	W48	.797	14815	25.0	15	-F		C	1525	40	.6	E	

Hα SOLAR FLARES

JUNE 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE 1977 JUN	START	MAX. PHASE	END	APPROX LAT.	APPROX LONG.	CENTRAL DISTANCE	HEIGHT PLAGE REGION	CMP DAY	MIN.		ZONE	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.		
179 HCMA	28	1810	1813	1826	N14	E16	.334	14822	30.0	16	-N		C	1813	25	.3	D	YS
180 HUAN	28	2016		2037	S20	W50	.809	14815	25.1	21	-F	1	C					YS
	28	2225	2335	NO FLARE PATROL														
	28	2346	2351	NO FLARE PATROL														
	29	0052	0145	NO FLARE PATROL														
	29	0152	0157	NO FLARE PATROL														
	29	0200	0207	NO FLARE PATROL														
	29	0210	0229	NO FLARE PATROL														
	29	0245	0320	NO FLARE PATROL														
GRP64181	29	0906	0908	0913	N14	E13	.295	14822	30.4	7	-F						DH	
MONT	29	0906	0908	0913	N14	E13	.295	14822	30.4	7	-F		C	0908	40		DH	
KANZ	29	0909E	0909	0909D	N14	E13	.295	14822	30.4		-N		C				C	
182 CATA	29	0935E	0940	0955	N24	W58	.865	14813	25.0	200	-F	2		0940	56	1.1		YS
183 MONT	29	0959	1001	1008	S21	W57	.871	14815	25.1	9	-F		C	1001	60		E	YS
GRP64184	29	1342		1354	N17	E03	.253	14822	29.8	12	-F							
HUAN	29	1342		1354	N19	E04	.298	14822	29.9	12	-F	2	C	1344	20	.2	D	
HUAN	29	1342		1353	N15	E03	.228	14822	29.8	11	-F	2	C					
185 HUAN	29	1811	1813	1819	N15	E03	.228	14822	30.0	4	-F	1	C	1813	15	.2	D	YS
	29	2011	2015	NO FLARE PATROL														
186 HUAN	29	2015E		2038D	N15	E02	.217	14822	30.0	230	-F	1	P	2024	15	.2	D	YS
	29	2100	2105	NO FLARE PATROL														
187 HUAN	29	2105E		2135	N14	E02	.200	14822	30.0	300	-N	2	P	2118	20	.2	D	YS
	29	2151	2203	NO FLARE PATROL														
188 MANI	30	0305E	0306	0310	N16	W02	.232	14822	30.0	50	-F		P	0306	50	.5	F	YS
189 HTPR	30	0812	0814	0827	S21	W68	.943	14815	25.2	15	-F		C	0814	10	.2		YS
190 HTPR	30	0922	0926	0929	S20	W69	.947	14815	25.2	7	-F		C	0926	30	.6		YS
GRP64191	30	1042+0	1044+6	1108	S21	W70	.953	14815	25.2	26	1N				110		E	
KHAR	30	1028	1045	1108	S22	W72	.963	14815	25.0	40	1F		C				E	
HTPR	30	1042	1044	1056	S20	W69	.947	14815	25.3	14	-N		C	1044	120	2.4	E	
HCMA	30	1042	1050	1112	S21	W68	.943	14815	25.3	30	1N		C	1050	100	3.0	E	
192 HTPR	30	1127	1132	1148	N20	E42	.700	14829	3.6	13	-F		C	1132	50	.7		YS
	30	2224	2231	NO FLARE PATROL														

"Remarks":

A = Eruptive prominence whose base is less than 90° from central meridian.
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No visible spots in the neighborhood.
H = Flare accompanied by a high speed dark filament.
I = Active region very extended.
J = Distinct variations of plage intensity before or after the flare.
K = Several intensity maxima.
L = Existing filaments show signs of sudden activity.
M = White-light flare.
N = Continuous spectrum shows effects of polarization.
O = Observations have been made in the calcium II lines H and K.
P = Flare shows helium D_3 in emission.
Q = Flare shows the Balmer continuum in emission.
R = Marked asymmetry in Hα line suggests ejection of high velocity material.
S = Brightness follows disappearance of filament (same position).
T = Region active all day.
U = Two bright branches, parallel (||) or converging (Y).
V = Occurrence of an explosive phase: important and abrupt expansion in about a minute with or without important intensity increase.
W = Great increase in area after time of maximum intensity.
X = Unusually wide Hα line.
Y = System of loop-type prominences.
Z = Major sunspot umbra covered by flare.

JUNE 1977

DAILY FLARE INDICES
Includes all Flares

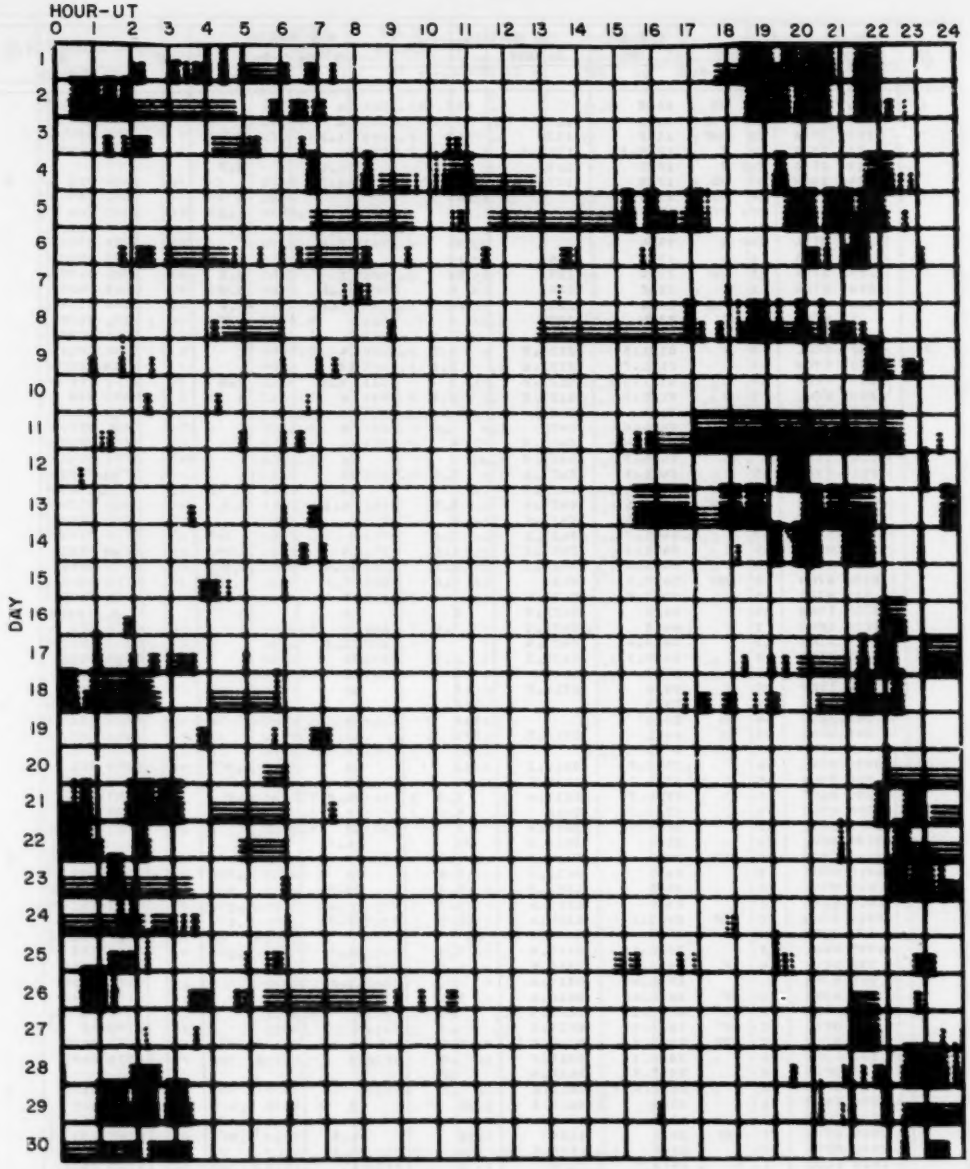
Date	Flare Index	HR OBS.	Date	Flare Index	HR OBS.	Date	Flare Index	HR OBS.
770601	0.00	20.9	770611	5.47	18.5	770621	3.85	21.6
770602	9.76	20.8	770612	8.66	23.2	770622	4.47	22.4
770603	24.54	24.0	770613	15.69	19.3	770623	42.47	22.6
770604	5.87	21.6	770614	.34	22.3	770624	98.10	23.8
770605	0.00	20.6	770615	8.66	24.0	770625	56.12	24.0
770606	12.90	23.5	770616	0.00	23.3	770626	255.61	23.3
770607	9.29	24.0	770617	13.42	21.6	770627	114.77	23.3
770608	11.83	22.7	770618	4.53	21.7	770628	32.64	22.8
770609	5.78	23.5	770619	1.69	24.0	770629	29.97	21.7
770610	11.88	24.0	770620	.84	23.9	770630	15.25	23.9

When no Flare Index is given, it is 0 for that day.

INTERVALS OF NO FLARE PATROL OBSERVATION

FOR PRECEDING SOLAR FLARE TABLE

JUNE 1977



Observatories included in total patrol:

Athenes	Herstmonceux	Kiev	McMath-Hulbert	Tashkent
Bucharest	Huancayo	Kodaikanal	Meudon	Tehran
Catania	Istanboul	Locarno	Mitaka	Upice
Culgoora	Kanzelhohe	Lvov	Monte Mario	Voroshilov
Haute Provence	Kharkov	Manila	Palehua	Wendelstein
			Ramey	Zürich

Times of no flare patrol are shown by the shaded area for each day divided into times of no cinematographic patrol (bottom half of day) and times of neither visual nor cinematographic patrol (top half of day).

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JUNE 1977

JUN 1977	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
1	260	ONDR	44 NS	0643 E		505 D	14			
	3100	CRIM	26 FAL	0800	0834		4			
	2800	OTTA	20 GRF	1100	1130	60	1.2	0.6		
	536	ONDR	8 S	1245.6	1245.6	.3	64			
	2800	OTTA	240 R	1605	1630	25	1.4	0.7		
	245	SGMR	43 NS	1700	1725.3	430 D	43.7			
	287	VORO	44 NS	2100		240		8		
	2800	OTTA	27A RF	1900		210	1.4	1.2		
	2800	OTTA	24 R	1900	1934	34	1.4	0.7		
	2800	OTTA	24P R	1934		136	1.4			
	2800	OTTA	1 S	1935	1940	10	0.8	0.4		
	2800	OTTA	21 GRF	2040	2100	50	1	0.5		
	2800	OTTA	1 S	2042	2044	4	1.6	0.8		
	2800	OTTA	26 FAL	2150	2230	40	-1.4	-0.7		
	18	MCMA	41 F	2236	2239	8			1	
2	1420	BCUL	3 S	0121.5	0122.5	2.5	4	1		
	2000	TYKW	45 C	0121.7	0122.6	2.3	13	4		45R
	2695	PENT	45 C	0121.8	0122.8	3	9.8	2.6		
	2695	BCUL	3 S	0122.5	0123.5	2.5	8	3		
	500	HIRA	45 C	0420	0420	.7	6	4		O
	500	HIRA	45 C	0424.6	0425	.6	8	4		O
	1000	TYKW	45 C	0426.5	0427.3	4	36	5		
	1000	TYKW		0426.5	0428.9		11			
	2000	TYKW	45 C	0426.5	0427.8	5.5	39	11		20R
	2000	TYKW		0426.5	0429.3		39			85L
	4995	ATHN	2 GRF	0426.5	0427.6	5.5	4.8	2.9		
	1400	SYDN	40 F	0426.6	0427.1	4				
	780	SYDN	40 F	0426.7	0427.2	3.8				
	500	HIRA	45 C	0426.8	0427.1	1.6	19	8		MR
	1415	ATHN	13 C	0426.8	0427.3	4.2	31.6	9.5		
	8800	ATHN	2 GRF	0427.1	0430	5.4	7.7	4.6		
	500	HIRA	45 C	0428.6	0429	2	7	3		MR
	3750	TYKW	45 C	0428	0428.9	3	4	2		OL,105102F
	5730	IRKU	1 S	0428	0428.9	2.5	3	2		
	1415	ATHN	13 C	0429.4E	0429.4		20.5			
	100	HIRA	45 C	0430.7	0431.3	2.3	30	5		O
	228	HARS	45 C	0445	0449	6	26	4		
	9400	TYKW	45 C	0516	0516.7	3	36	10		OL
	200	GORK	44 NS	0530 E		310		5		
	260	ONDR	44 NS	0640 E		508 D	50			
	245	SGMR	43 NS	1431	1710.8	579 D	89.7			
	202	IZMI	42 SER	0710		95	35			
	3000	BERL	46	0803.5	0810.2	13	29	7.2		
	808	ONDR	45 C	0804.3	0805.5	6	38			
	2695	MANI	1	0804.3	0810.4	6.9	36.2	6.7		
	536	ONDR	45 C	0804.5	0810	6.5	18	4.4		
	1470	BERL	46	0804.5	0810.4	8	32	9		
	9500	BERL	20	0804	0810.2	36	4.7			
	3100	CRIM	41 SER	0805	0810.2	6.5	7	2		
	1415	MANI	1	0805	0810.5	6.6	32	6.7		
	606	MANI	1	0805	0810.5	6.8	20.5	2.9		
	1415	ATHN	1 F	0805	0810.6	8.7	28.4	14.2		
	8800	ATHN	2 GRF	0805.1	0824.4	26.8	7.7	4.6		
	930	BORD	41 F	0805	0806.1		7	48		C
	4995	MANI	1	0806.1	0810.4	7.9	3.7	1.2		
	950	GORK	4 SF	0806.4E	0810.6	4.7	12.5			
	650	GORK		0806.4E	0811.4		19.8			
	650	GORK	4 SF	0806.4E	0806.6	5.4E	16.5			
	33	UPIC	2 S/F	0807.1	0807.3	.5				
	29	UPIC	2 S/F	0807.2	0807.3	.3				
	4995	ATHN	2 GRF	0809.8	0810.7	2.6	4.8	2.9		
	100	GORK	6 S	0810.1	0810.3	.9	200	60		
	33	UPIC	8 S	0810.3	0810.4	.7				
	29	UPIC	8 S	0810.4	0810.6	.7				
	5730	IRKU	1 S	0810	0810.3	1	3	1.5		
	3100	CRIM	24 R	1123	1247		3			
	2800	OTTA	21 GRF	1450	1635	155	1.8	0.9		
	2800	OTTA	40 F	1505	1520.5	24	3.2			
	1420	BCUL	1 S	1519.5	1520	2	1			
	2695	BCUL	3 S	1520.5	1521	2.5	5	2		
	1420	ARCE	1	1520	1520.5	2.3				
	2800	OTTA	8 S	1710.5	1710.5	0.5	6.2			
	2800	OTTA	240 R	1905	1935	30	1.4	0.7		
	2695	PENT	45 C	2003	2006.2	5	4.8	1.2		
	1420	BCUL	8 S	2005.5	2006	1.5	3	1		
	2695	BCUL	8 S	2006.5	2007	1.5	5	2		
	2800	OTTA	240AR	2047	2340	173	3	1.5		
	2000	TYKW	5 S	2139	2139.1	.3	1	.3		80L
	1000	TYKW	5 S	2139	2139.1	.3	1.8	.6U		
	2800	OTTA	40 F	2139	2139.1	2	3.2			
	1000	TYKW	5 S	2140.3	2140.6	.6	4	.8		
	2000	TYKW	5 S	2140	2140.6	1	4	1		90L
	2695	PENT	3 S	2336.2	2336.9	1	11.4	2.9		

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JUNE 1977

JUN 1977	FREQUENCY	STATION	TYPE		STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	2695	MANI	3		2336.6	2337.2	.9	11.9	1.3		
	2000	TYKW	5	S	2336.7	2336.9	.6	4	1		90L
	3750	TYKW	5	S	2336.8	2336.9	.2	11	5		OR
	1000	TYKW	45	C	2336	2337.6	2	5	1		
3	200	GORK	44	NS	0342 E		348		7		
	260	ONDR	44	NS	0639 E		509 D	57			
	245	SGMR	43	NS	1409.8	2033	601.2D	21.3			
	9100	ARCE	21		0900.7	0924.7	163				
	1470	BERL	22		0904	0923.5	26	2.8			
	3000	BERL	22		0905	0923.2	27	7.8			
	9500	BERL	20		0905	0923.5	29	10			
	3100	CRIM	20	GRF	0908	0923	49	6	2		
	1420	ARCE	20		0908.3	0923.6	49				
	9100	GORK	20	GRF	0908.8	0924	34.7	15	6		
	9100	ARCE	3		0922.9	0923	.6				
	9100	ARCE	2		0938.2	0938.4	1				
	9100	ARCE	1		0944	0944.1	.6				
	2800	OTTA	26	FAL	1105	1140	35	-1.6	-0.8		
	650	GORK	2	SF	1151.7	1152.5	1.9	15.8	7.4		
	8800	ATHN	2	S	1218.8	1221.8	13.9	4.1	2.5		
	4995	ATHN	2	S	1218.8	1222.9	8.7	2.7	1.6		
	3000	BERL	20		1312.5	1323.5	35	3.5			
	2800	OTTA	24P	R	1313.2		26.8	0.6			
	2800	OTTA	24	R	1313	1313.2	0.2		0.3		
	2800	OTTA	27	RF	1313		41	0.6	0.5		
	9500	BERL	20		1315	1328	40	4.5			
	1470	BERL	20		1322	1329	18	1			
	2800	OTTA	26	FAL	1340	1354	14	-0.6	-0.3		
	2800	OTTA	20	GRF	1620	1720	130	1.2	0.6		
	2800	OTTA	20	GRF	1835	1900	65	0.8	0.4		
	2800	OTTA	21	GRF	2110	2025	100	2	1		
	2800	OTTA	20	GRF	2111	2112.5	20	1.6	0.6		
4	100	HIRA	45	C	0046.3	0046.7	1	630	200		O
	1000	TYKW	45	C	0046	0046.2	1	7	1		
	2695	PENT	240	R	0055	0105	10	1.6	0.8		
	2000	TYKW	5	S	0153.3	0153.7	1	1.1	.4		OL
	200	GORK	43	NS	0306 E		129		5		
	260	ONDR	44	NS	0603 E		553 D	19	4		
	127	TORN	44	NS	0630 E	1241	510 D	18			V=0
	200	GORK	43	NS	0836		60		5		
	245	SGMR	44	NS	0912 E	1653.8	900 D	99.6			
	207	VORO	44	NS	2100		240		11		
	2800	OTTA	2	S/F	1131	1132.1	5	1.2	0.6		
	237	TRST	41	F	1413.7	1413.8	.1	84			R
	237	TRST	41	F	1550.6	1550.6	.1	117			
	237	TRST	41	F	1655.7	1656	.4	302			
5	100	HIRA	43	NS	0230	0830	360 D	50	18		ML
	200	GORK	44	NS	0300 E		120 D		8		
	260	ONDR	44	NS	0603 E		549 D	14			
	127	TORN	44	NS	0630 E	0935.7	510 D	51			V=1
	245	SGMR	44	NS	0911 E	2256.9	902 D	34.2			
	100	HIRA	44	NS	1925 E	0440	865 D	80	20		ML
	207	VORO	44	NS	2100	2249	240	15	9		
	3100	CRIM	1	S	0800	0803	8	3	1		
	3100	CRIM	1	S	0906	0909	7	3	1		
	3100	CRIM	1	S	1000	1005	10	3	1		
	29	UPIC	8	S	1240.4	1240.8	.7				
	33	UPIC	8	S	1240	1240.1	.7				
	2800	OTTA	20	GRF	1305	1350	95	1	0.5		
	2800	OTTA	20	GRF	1625	1636	95	1	0.5		
6	2695	PENT	20	GRF	0005	0020	60	1.2	0.6		
	260	ONDR	44	NS	0608 E		542 D	42			
	127	TORN	44	NS	0630 E		510 D				V=0
	169	DWIN	44	NS	1225		147		2		
	245	SGMR	43	NS	1317	1330.5	23.2	8.9			CONT
	3100	CRIM	20	GRF	0832	0838	11	2	1		
	3100	CRIM	1	S	0903	0905	3	2	1		
	3100	CRIM	5	S	1003	1010	11	2	1		
	3100	CRIM	1	S	1156	1158	7	2	1		
	3100	CRIM	5	S	1242	1247	14	3	1		
	2800	OTTA	20	GRF	1815	2000	240	2.6	1.3		
	245	SGMR	43	NS	2043.2	2346.8	209.8D	21.6			CONT
7	200	GORK	44	NS	0300 E		600 D		10		
	260	ONDR	44	NS	0606 E		542 D	24	3		
	160	DWIN	44	NS	0700		395		15		
	169	DWIN	44	NS	0700		395		15		
	127	TORN	44	NS	0720 E	1213.7	460 D	80			V=1
	245	SGMR	44	NS	0911 E	1118	903 D	165			3,CONT
	100	HIRA	44	NS	1925 E	2250	525 D	400	130		SR
	207	VORO	44	NS	2100	2125	240	28	15		

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JUNE 1977

JUN 1977	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	3100	CRIM	5 S	0513	0517	10	3	1		
	228	HARS	45 C	0628	0628.8	1.5	50	20		
	202	IZMI	42 SER	0715		285	33			
	550	KIEV	40 F	0751.5	0753.5	7	12			
	3100	CRIM	1 S	0851	0855	7	2	1		
	550	KIEV	7 C	1242.7	1243.5	9	3.5			
	2800	OTTA	2 S/F	1322.5	1322.6	1	1.6	0.8		
	536	ONDR	8 S	1445.4	1445.4	.3	18			
	228	HARS	45 C	1553.2	1555	2	63	30		
	228	HARS	45 C	1713.5	1713.7	2	140	30		
	228	HARS	45 C	1750.3	1752	2.5	130	35		
	2800	OTTA	240 R	1830	1840	10	1.4	0.7		
	2800	OTTA	240 R	1910	1940	30	0.8	0.4		
	2800	OTTA	20 GRF	2120	2255	110	1.6	0.8		
8	260	ONDR	44 NS	0606 E		543 D	19			
	127	TORN	44 NS	0720 E	1109.8	375 D	150 U			V=1
	245	SGMR	44 NS	0911 E	1144.3	903 D	65.8			CONT
	160	DWIN	44 NS	0915		285		10		
	169	DWIN	44 NS	0915		285		10		
	207	VORO	44 NS	2100		240		12		
	536	ONDR	8 S	1115.8	1115.8	.3	19			
	2800	OTTA	20 GRF	1500	1537	65	1	0.5		
	2800	OTTA	20 GRF	1640	1655	45	1	0.5		
	2800	OTTA	20 GRF	1810	1930	150	1.2	0.6		
	2800	OTTA	240 R	2235	2255	20	1.2	0.6		
	606	SGMR	4 S/F	2344.5	2344.8	.5	169	68		CONT
	245	SGMR	6 S	2344.6	2344.7	.4	20.6	8.2		CONT
	1415	SGMR	1 S	2344.7	2344.8	.2	4.6	1.8		CONT
	410	SGMR	6 S	2344.8	2344.9	.2	18.8	7.5		CONT
	245	SGMR	6 S	2349.6	2350.2	1.3	105	42		CONT
	606	SGMR	4 S/F	2349.7	2350.2	.9	250	100		CONT
	1415	SGMR	4 S/F	2349.7	2349.8	.5	23.3	9.3		CONT
	2695	SGMR	4 S/F	2349.7	2350.1	.5	51	20.4		CONT
	410	SGMR	6 S	2349.8	2349.9	1	84.7	33.9		CONT
	245	SGMR	48 C	2359.4	2401.3	3.1	758	303		CONT
9	606	SGMR	45 C	0001	0001.4	1.2	241 U	96.4U		CONT
	410	SGMR	7 C	0001.1	0001.4	1	205	82		CONT
	1415	SGMR	1 S	0001.2	0001.3	.8	5.3U	2.1U		CONT
	2695	SGMR	4 S/F	0001.2	0001.3	.7	38.9U	15.6U		CONT
	606	SGMR	45 C	0001.8E	0001.8		122 U			CONT
	410	SGMR	7 C	0001.9E	0001.9		72			CONT
	260	ONDR	44 NS	0606 E		543 D	54			
	127	TORN	44 NS	0630 E	0833.5	360 D	53			V=1
	160	DWIN	44 NS	0755		373		5		
	169	DWIN	44 NS	0755		373		5		
	245	SGMR	43 NS	1044.9	1324.8	810.10	32.3			3G.5,CONT
	202	IZMI	42 SER	0635		90	26			
	536	ONDR	8 S	1116.2	1116.2	.3	48			
	536	ONDR	1 S	1117.8	1117.8	.3	11			
	1420	BERL	1	1230	1235	13	1.7			
	3000	BERL	1	1231.5	1235	6.5	2.9			
	33	UPIC	46 C	1233.3	1234.5	8.7				
	228	HARS	45 C	1233.3	1233.7	1	40	17		
	29	UPIC	46 C	1233.5	1235	8.7				
	245	SGMR	6 S	1233.8	1234.3	4.1	92.2	27.7		5,CONT
	237	TRST	41 F	1234.7	1235.3	.8	276		12	R
	536	ONDR	8 S	1327.6	1327.6	.3	75			
	536	ONDR	8 S	1331	1331	.3	59			
	2800	OTTA	20 GRF	1730	1734.5	30	2.8	0.7		
	7000	SAOP	1 S	1733.6	1734.5	2.9	5	2.5		
	930	BORD	46 C	1733	1736.6		4	54		C
	2695	BCUL	3 S	1733	1735.5	6.5	4	1		
	1420	BCUL	8 S	1733	1734.5	2.5	5	2		
	2800	OTTA	21 GRF	1820	1833	40	1	0.5		
	606	SGMR	4 S/F	1822.7	1827.6	7.4	5	1.5		5
	4995	SGMR	22 GRF	1823	1827.3	21.4	46.5	13.9		5
	1415	SGMR	4 S/F	1825.3	1827.8	3.6	14.1	4.2		5
	9400	HUAN	1 S	1825.5	1827.3	3.9	14.6	4.4		L
	8800	SGMR	4 S/F	1825.8	1827.2	7.3	12.9	3.9		5
	18	MCMA	41 F	1825	1830	12			2	
	1420	BCUL	45 C	1825	1827	4	4	1		
	2800	OTTA	28 PRE	1826.2	1826.5	0.5	2.4	1.8		
	2800	OTTA	4 S/F	1826.7	1827.3	2.3	41	10		
	245	SGMR	6 S	1826.4	1827.1	3	154	46.1		5
	2695	BCUL	8 S	1826.5	1828	2.5	33	11		
	7000	SAOP	2 S/F	1826.9	1827.2	1.3	24	7.8		
	4995	BCUL	8 S	1826	1827	2	32	11		
	930	BORD	3 S	1827	1827.8		1	16		B
	2800	OTTA	20 GRF	1925	2015	85	1.6	0.8		
	18	MCMA	6 S	2030	2034	6			1	
	2800	OTTA	240 R	2240	2245	5	0.8	0.4		
10	3100	CRIM	26 FAL	0855	1040		3			

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JUNE 1977

JUN 1977	FREQUENCY	STATION	TYPE		STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	930	BORD	41	F	0939.3	0939.3		.7	13		B
	536	ONDR	8	S	1036.8	1036.8	.3	46			
	2800	OTTA	20	GRF	1550	1630	190	1.6	0.8		
	930	BORD	46	C	1559	1559.1		.4	46		B
	245	SGMR	43	NS	1700.9	1742.3	435.1D	19.3			3
11	2000	TYKW	5	S	0559	0600.7	8	7	1.5		OL
	3750	TYKW	5	S	0600	0600.7	2	4	1		OR
	260	ONDR	44	NS	0608 E		558 D	29			
	127	TORN	43	NS	0955 U		240 D				V=0
	245	SGMR	43	NS	1057.2	1057.9	154.8	34			
	9100	ARCE	4		0751.9	0753.3	3				
	3100	CRIM	5	S	1004	1011	17	4	1		
	550	KIEV	42	SER	1103.7		95	1.2			
	245	SGMR	43	NS	1842.9	2309.5	333.1D	77			
	2800	OTTA	240	R	1957	1958	1	0.8	0.4		
	2800	OTTA	20	GRF	2010	2020	40	1.6	0.8		
	2800	OTTA	20	GRF	2135	2143	25	0.8	0.4		
12	260	ONDR	44	NS	0600 E		554 D	6			
	2950	GORK	20	GRF	0736.3	0742.3	11.7	5.7	2.9		
	9100	ARCE	20		0737.7	0742.5	31.5				
	950	GORK	1	S	0739.3	0742.2	3.5	8.5			
	1420	ARCE	40		0739.6	0740.1	6.5				
	650	GORK	1	S	0739.7	0742.2	3.1	7.5	2.2		
	3100	CRIM	1	S	0740	0747	6	3	1		
	808	ONDR	8	S	0741.6	0741.6	.3	38			
	930	BORD	41	F	0742	0742.1		.5	97		B
	3100	CRIM	5	S	0814	0817	8	5	2		
	3100	CRIM	1	S	0942	0945	7	4	1		
	3100	CRIM	1	S	1105	1107	6	2	1		
	2800	OTTA	1	S	1233	1234.4	7	1.6	0.8		
	2800	OTTA	20	GRF	1515	1516	15	1.2	0.6		
13	207	VORO	4	S/F	0031	0032	2	125			
	2000	TYKW	45	C	0350	0408.6	30	15	5		15L
	2000	TYKW	30	PBI	0420		160	5	2		
	1000	TYKW	45	C	0350	0408.8	30	20	4		
	1000	TYKW	30	PBI	0420		160	1.5	.8		
	500	HIRA	45	C	0355.6		26		4		
	500	HIRA			0355.6	0408.6		10			ML
	500	HIRA			0355.6	0412		11			ML
	500	HIRA			0355.6	0413.7		13			WL
	500	HIRA			0355.6	0415		8			O
	3750	TYKW	20	GRF	0355	0410	120	8	3		OR,101009F
	1415	MANI	1		0356	0408.4	38.4	21.6	7.2		
	606	MANI	1		0357.6	0409	38.4	19.7	7.6		
	500	HIRA			0426	0431.4		18			WL
	500	HIRA	45	C	0426		9		7		
	500	HIRA			0426	0429.3		20			ML
	2000	TYKW	45	C	0428	0431.2	4	9	2		65L
	1000	TYKW	45	C	0429.4E	0431.1	3 D	26	8 D		
	260	ONDR	44	NS	0603 E	0739.5	231	6			
	3100	CRIM	26	FAL	0717	0753		3			
	3100	CRIM	5	S	0802	0822	25	4	1		
	3100	CRIM	31	ABC	0828	0840	38	3	1		
	3100	CRIM	5	S	0906	0917	15	5	2		
	3100	CRIM	5	S	1114	1116	14	3	1		
	536	ONDR	8	S	1132.2	1132.2	.3	38			
	4995	BOUL	3	S	1802	1803.5	3.5	16	5		
	4995	BOUL	3	S	1822.5	1823.5	2.5	10	3		
	2695	BOUL	8	S	1825.5	1826.5	1.5	17	6		
	4995	BOUL	40	S	2106	2110.5	7.5	34	13		
	2695	BOUL	45	C	2113.5	2114	2	10	3		
14	8800	ATHN	2	GRF	0649.3	0657.6	11.7	10.2	6.1		
	8800	ATHN	2	GRF	0704.5	0708.4	15.5	13.6	8.2		
	3100	CRIM	1	S	0855	0858	7	3	1		
	3100	CRIM	1	S	1014	1016	6	2	1		
	3100	CRIM	20	GRF	1212	1250	25	4	1		
	2800	OTTA	20	GRF	1440	1510	120	1.2	0.6		
	4995	BOUL	45	F	2228	2230	3.5	10	3		
	2695	BOUL	8	S	2229	2231.5	3	6	2		
	2695	BOUL	8	S	2235	2235.5	2	4	1		
15	3100	CRIM	20	GRF	0727	0800	88	5	2		
	3100	CRIM	25	R	1029	1214		5			
	536	ONDR	8	S	1236.7	1236.7	.3	184			
	3100	CRIM	5	S	1245	1254	16	5	2		
	2800	OTTA	20	GRF	1500	1555	170	1.4	0.7		
	2800	OTTA	20	GRF	1820	1840	100	1.2	0.6		
16	260	ONDR	2	S/F	1039.2	1039.2	.8	4	.6		
	930	BORD	46	C	1754	1754		.3	33		B
17	127	TORN	41	F	0911.3	0915.3	8	19			PEAKING

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JUNE 1977

JUN 1977	FREQUENCY	STATION	TYPE		STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} MEAN	INT	POLARIZATION OR REMARKS
	550	KIEV			1015		14	2			
	3100	CRIM	5	S	1032	1034	22	3	1		
	550	KIEV	49	GB	1039		10.5	20 D			
	9100	ARCE	20		1039.5	1054.5	122				
	606	SGMR	4	S/F	1041	1045	6.4	156	46.8		
	536	ONDR	45	C	1041	1045.3	7	68	25		
	1415	SGMR	2	S/F	1042.2	1045.4	6	6.4	2.5		
	410	SGMR	6	S	1043.4	1045.3	3.6	8.5	2.5		
	1420	ARCE	4		1043.5	1045.2	4.6				
	3000	BERL	1		1044.5	1045.4	2	2.4			
	930	BORD	46	C	1044	1046		4	41		E
	808	ONDR	45	C	1044	1045.6	2.5	62	15		
	9500	BERL	20		1045	1052.5	15	5.9			
	1470	BERL	4		1045	1045.5	10	5.3			
	245	SGMR	6	S	1418	1418.6	1.2	8.4	2.5		
	410	SGMR	6	S	1418.6	1418.7	.6	15.9	4.8		
	2800	OTTA	240	R	2100	2120	20	1	0.5		
18	3100	CRIM	24	R	0825	0951		4			
	2800	OTTA	28	GRF	1420	1510	140	2	1.3		
	930	BORD	46	C	1506	1507.2		4	13		B
	245	SGMR	6	S	1824.3	1825.6	1.7	25.1	7.5		
	606	SGMR	3	S	1824.8	1825	.9	98.6	29.6		
	410	SGMR	6	S	1825.1	1825.2	.6	20.9	6.3		
	1415	SGMR	3	S	1826	1826.1	.5	16.3	1.6		
20	550	KIEV	41	F	0814.5	0815	12	12			
	550	KIEV	41	F	0900	0904.2	5	48			
	930	BORD	46	C	0947	0947.4		.4	19		B
	3100	CRIM	1	S	1117	1119	7	7	2		
	3100	CRIM	24	R	1130	1300		3			
22	3100	CRIM	24	R	0647	0759		6			
	536	ONDR	8	S	0914	0914	.3	34			
	930	BORD	8	S	1106	1106		.1	36		A
	2800	OTTA	28	GRF	1130	1155	70	1.6	0.8		
	2800	OTTA	24	R	1450	1512	22	3.4	1.7		
	2800	OTTA	27	RF	1450		190	3.4	3		
	536	ONDR	3	S	1453.2	1453.2	.3	18			
	2800	OTTA	24P	R	1512		138	3.4			
	2800	OTTA	26	FAL	1730	1800	30	-3.4	-1.7		
	180	HIRA	45	C	1957.3	1957.5	.7	1170	380		O
	180	HIRA	45	C	2110	2111	2	1200	800		WL
	2800	OTTA	2	S/F	2116.7	2117.7	2.8	6.8	3.3		
	500	HIRA	5	S	2116.9	2117.7	2	7	2		O
	1420	BCUL	3	S	2116	2117.5	3	9	3		
	200	HIRA	45	C	2117	2117.7	1.3	180	48		WL
	207	VORO	4	S/F	2117	2118	1.5	105			
	2695	BCUL	3	S	2118	2119	2.5	7	2		
	1800	TYKW	5	S	2336	2337.2	2	1.2	.3		
	1000	TYKW	45	C	2338	2339	3	3	.7		
	1000	TYKW			2338	2340.1		2.5			
23	1400	SYDN	45	C	0010.2	0017	9.2				
	1000	TYKW	45	C	0010	0012.2	4	13	3.5		
	2000	TYKW	45	C	0010	0012.3	4	6	1.5		75R
	2695	PENT	48	F	0010	0017	12	6.9			
	207	VORO	7	C	0013	0014	4	46			
	207	VORO			0013	0016		61			
	200	HIRA	45	C	0014	0014.7	1	70	28		O
	2000	TYKW	45	C	0014	0017.3	5	13	3.5		80R
	2800	TYKW			0014	0014.9		6			80R
	1000	TYKW	45	C	0014	0017.3	5	23	5.5		
	1000	TYKW			0014	0014.9		13			
	500	HIRA	5	S	0016.3	0017	2.3	8	3		WL
	200	HIRA	45	C	0016.3	0017	1	40	15		O
	780	SYDN	48	F	0016.3	0017	1.2				
	3750	TYKW	5	S	0016	0017	2	3	1		
	1000	TYKW	45	C	0104.9	0105.3	1	35	8		
	2695	PENT	1	S	0104.9	0105.2	1.5	8	1.8		
	1400	SYDN	15		0105	0105.3	.8				
	2000	TYKW	5	S	0105	0105.3	1	5	1		0R
	3100	CRIM	28	GRF	0742	0804	35	5	2		
	3100	CRIM	20	GRF	0830	0840	22	3	1		
	268	ONDR	42	SER	0847	0905.3	27	8			
	3100	CRIM	24	R	1004	1115		5			
	950	GORK	23	GRF	1007.1	1031.8	110.9	3	1.5		
	650	GORK	41	F	1008.9	1109.1	11.1	7.2			
	650	GORK			1008.9	1114.9	1.6	5.7			
	650	GORK			1008.9	1119.6	.9	2.5			
	2800	OTTA	21	GRF	1050	1155	190	4	2		
	9500	BERL	28		1119	1155.5	82	6.3			
	268	ONDR	43	NS	1123		238 D	7			
	245	SGMR	43	NS	1200	1723.3	740 D	582			3G,5
	650	GORK	5	S	1136	1138.1	4.2	8.7	4.3		

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JUNE 1977

JUN 1977	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	950	GORK	1 S	1146.1	1146.8	1.1	6	3		
	2800	OTTA	40 F	1146.5	1153	11	16			
	1420	ARCE	40	1147.2	1152.8	12.8				
	2950	GORK	20 GRF	1147.3	1153	10.7	14.2			
	410	SGMR	6 S	1149.9	1154.3	6.6	13.3	4		
	650	GORK	1 S	1150.3	1153.3	5.6	5	2.5		
	2695	SGMR	4 S/F	1150.7	1153	8.8	20.2	6		
	3000	BERL	46	1150	1152.8	4.7	7.5	2.5		
	245	SGMR	6 S	1151.1	1154.1	6.3	15.4	4.6		
	1415	SGMR	2 S/F	1151.2	1153.2	6.3	5.5	1.7		
	1470	BERL	46	1151	1154	7	6.9	2.6		
	606	SGMR	2 S/F	1152.6	1153.2	3.7	2.4	.7		
	9100	ARCE	1	1155	1155.2	.7				
	950	GORK	20 GRF	1207	1234.5	44	5	1.5		
	2800	OTTA	8 S	1426	1426.1	0.5	1.6			
	2800	OTTA	20 GRF	1500	1600	100	1.4	0.7		
	237	TRST	41 F	1519	1519.4	.7	52			
	4995	BOUL	1 S	1628	1628.5	1.5	10	3		
	2695	BOUL	1 S	1629.5	1630.5	1.5	2	1		
	2695	BOUL	45 C	1640	1641	2	2	1		
	4995	BOUL	1 S	1640	1641	2.5	8	3		
	237	TRST	41 F	1722.3	1722.9	1.1	131			
	228	HARS	45 C	1722.4	1723	1.1	130	40		
	1420	BOUL	40 F	1823.5	1826.5	12.5	20	4		
	2800	OTTA	45 C	1823.8	1825	4.5	9.8	2.5		
	2695	BOUL	45 C	1824.5	1826	6	10	3		
	4995	BOUL	1 S	1826	1826.5	2	6	2		
	1420	BOUL	8 S	2109	2110.5	2	6	2		
	200	HIRA	45 C	2110	2110.7	1.5	3000	300		O
	606	SGMR	4 S/F	2110.2	2110.5	.7	28.8	8.6		S
	2800	OTTA	1 S	2110.3	2110.8	1	1.4	0.7		
	245	SGMR	6 S	2110.4	2111	1.5	121.6	36.5		S
	500	HIRA	45 C	2110.5	2110.8	1.3	14	6		O
	1415	SGMR	4 S/F	2110.6	2110.8	.4	10	5.4		S
	410	SGMR	6 S	2110.9	2111	.2	35	10.5		S
	207	VORO	4 S/F	2110	2111	2	250			
	2695	BOUL	1 S	2111.5	2112	2	3	1		
	18	HOHA	6 S	2111	2114	4			1	
	9400	TYKW	45 C	2205	2206.7	4	14	4		OL
	4995	BOUL	45 C	2229.5	2231	4.5	13	4		
24	2000	TYKW	21 GRF	0000	0028	110	2.5	1		OR
	1000	TYKW	21 GRF	0000	0250	340	5.7	3.4		
	2695	PENT	21 GRF	0003	0035	100	5.2			
	2695	PENT	20 GRF	0004	0010	12	2.8	1.8		
	3750	TYKW	5 S	0020	0024	7	19	7		
	3750	TYKW	29 PBI	0027		65	3	1		
	1420	BOUL	3 S	0021.5	0023.5	6	3	1		
	4995	BOUL	3 S	0021	0023.5	5	27	9		
	9400	TYKW	5 S	0021	0023.8	6	35	12		25L
	9400	TYKW	29 PBI	0027		75	5	2		
	4995	MANI	3	0022	0023.8	11.2	37	16.8		
	8800	MANI	3	0022	0023.8	11	42.8	17.6		
	1415	MANI	3	0022	0023.8	15.5	3.7	1.2		
	2695	MANI	3	0022	0023.8	7.5	8.9	3		
	2695	PENT	1 S	0022.8	0024	8	9.4	3.2		
	2695	BOUL	3 S	0022	0025	8.5	10	3		
	2000	TYKW	5 S	0022	0023.9	5	5	2		15R
	1000	TYKW	5 S	0022	0024	5	19	1.5		
	2695	PENT	20 GRF	0047	0051	13	1.4	0.8		
	100	HIRA	42 SER	0116.7	0120	6	550			O
	200	HIRA	45 C	0119	0120	2	600	100		O
	2695	BOUL	3 S	0128	0129.5	4.5	3	1		
	4995	BOUL	45 C	0128	0128.5	4	16	4		
	200	GORK	44 NS	0300 E		480		5		
	268	ONDR	44 NS	0600 E		200	7			
	127	TORN	44 NS	0720 E	1010 U	460 D				V=1
	100	GORK	43 NS	0828		560 D		5		
	245	SGMR	44 NS	0911 E	2337.9	909 D	79			
	5730	IRKU	2 S	0314	0314.2	.5	25	12		
	9100	GORK	46 C	0343.8	0344.6	4.3	25.5			
	9100	GORK		0343.8	0346		12.8			
	5730	IRKU	1 S	0344	0344.5	3.5	8	3		R
	9400	TYKW	45 C	0344	0344.4	4	23	7		45L
	700	SYDN	8 S	0459.3	0459.5	.3				
	9100	GORK	20 GRF	0531.2	0538.7	17	5	2		
	9100	GORK	23 GRF	0648.3	0903	315 D	31.8	17		
	650	GORK	41 F	0704		33				
	650	GORK		0704	0704.3	.5	4			
	650	GORK		0704	0705.9	.8	4.7			
	650	GORK		0704	0708.2	2.2	17.6			
	650	GORK		0704	0712.3	7.9	44			
	650	GORK		0704	0731.4	3.1	13.5			
	650	GORK		0704	0743.4	5.3	60			
	2950	GORK	20 GRF	0705	0741.6	43.1	6.6	2.5		

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JUNE 1977

JUN 1977	FREQUENCY	STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1}		INT	POLARIZATION OR REMARKS
				UT	UT	MINUTES	PEAK	MEAN		
24	1000	TYKW	45 C	0705	0707.6	4.5	52	7		
	950	GORK	21 GRF	0706		342		13.5		
	950	GORK	4 SF	0706.5	0707.8	2	19.5			
	808	ONDR	46 C	0706	0743.2	40	112	7		
	808	ONDR		0712.5E	0712.5		95			
	1000	TYKW	45 C	0709.5	0713.2	9.5	62	5.5		
	1000	TYKW		0709.5	0711.2		28			
	1000	TYKW		0709.5	0711.8		43			
	1000	TYKW		0709.5	0714		37			
	950	GORK	46 C	0711	0711.5	8.5	43			
	950	GORK		0711	0713		51			
	950	GORK		0711	0714		37			
	3100	CRIM	24 R	0711	0904		12			
	3000	BERL	28	0735	0749.4	28	5.1			
	1420	ARCE	23	0737.2	0902.6	128				
	1000	TYKW	45 C	0737	0743.4	13	56	5		
	9500	BERL	4	0739.5	0741.4	6.5	16			
	1470	BERL	1	0740	0743.4	8	2			
	950	GORK	46 C	0741.2	0741.5	3.8	10			
	950	GORK		0741.2	0743.3		46			
	9100	GORK	1 S	0741.4	0741.7	1	14	7		
	9100	ARCE	1	0741.5	0741.8	1				
	9400	TYKW	5 S	0741	0741.7	4	18	3		BL
	550	KIEV		0755 E	0830 U					
	550	KIEV	46 C	0755 E	0820 U	60 D	27 D			
	1470	BERL	22	0801	0902.5	379	18			
	9100	ARCE	22	0802	0903.9	240				
	3000	BERL	22	0805	0902	397	22			
	536	ONDR	47 GB	0805	0824.6	27	280	58		
	536	ONDR	29 PBI	0833	0848.8	32	10	6		
	650	GORK	41 F	0806.1E	0807.8	9.5	30	15		
	650	GORK		0806.1E	0811.4	4.6	24			
	9500	BERL	22	0810	0931	320	30			
	2950	GORK	21 GRF	0811	0902.6	300	23			
	650	GORK	47 GB	0815.8	0824.7	17.7U	474			
	650	GORK		0815.8	0821.8	1.8U	329			
	650	GORK		0815.8	0824	.5U	290			
	650	GORK	29 PBI	0815.8	0828.9	67.1	379			
	550	KIEV	48 C	0816		17.5	27 D			
	808	ONDR	49 GB	0816	0825.7	19	210	102		
	808	ONDR	29 PBI	0835	0843.3	54	80	15		
	950	GORK	46 C	0819.3	0822.3	16.7	37			
	950	GORK		0819.3	0827		39			
	950	GORK		0819.3	0832.1		40			
	500	HIRA	45 C	0820.6		9		50		
	500	HIRA		0820.6	0822		170			WL
	500	HIRA		0820.6	0825.3		220			WL
	3100	CRIM	2 S	0825	0828	2	10	3		
	9100	GORK	1 S	0825.7	0826.2	1.3	8.9	4.5		
	1470	BERL	3	0825	0826	3	13			
	113	POTS	45 C	0825	1009	175	28	6		
	950	GORK	47 GB	0835.9	0844.7	17.3	190			
	950	GORK		0835.9	0841.6		175			
	950	GORK		0835.9	0843.5		186			
	650	GORK	3 S	0842.7	0844.4	3.9	43			
	650	GORK		0842.7	0848.1	3.8	23			
	9100	GORK	1 S	0842.9	0843.9	2.5	11.4	5.5		
	1470	BERL	46	0842	0848	12	27			
	1420	ARCE	45	0842	0847.9	11.5				
	1420	ARCE		0842	0843.9	4.5				
	1420	ARCE		0846.5	0847.9	7				
	9100	GORK	1 S	0846.5	0848	3.3	8.9	4.5		
	950	GORK	3 S	0853.2	0857	6.8	25	8.5		
	950	GORK	3 S	0901.8	0903.8	4.5	54			
	200	GORK	27 RF	0915.5	0934.4	32.1	12	6		
	1420	ARCE	40	0922	0930	15				
	1470	BERL	3	0929	0930	5.5	27			
	1415	SGMR	4 S/F	1007.3	1012.9	9.1	62.1	18.6		
	1420	ARCE	4	1007.5	1013	10				
	1470	BERL	3	1010	1013	7.5	69			
	550	KIEV	42 SER	1128 U		90	2			
	2800	OTTA	26A FAL	1215	1335	80	-3.2	-1.6		
	2800	OTTA	21 GRF	1242	1255	53	3.6	1.8		
	2950	GORK	1 S	1250.5	1253	8.4	8.6	3.6		
	2800	OTTA	1 S	1250	1253	4	3.4	1.8		
	3100	CRIM	1 S	1251	1253	3	5	2		
	2800	OTTA	26A FAL	1415	1450	35	-3.2	-1.6		
	2800	OTTA	2 S/F	1439.5	1440	1.7	2	1		
	1420	ARCE	1	1439.6	1439.7	.7				
	9100	ARCE	2	1440	1440.3	2.3				
	2800	OTTA	26 FAL	1550	1600	10	-1	-0.5		
	8800	ATHN	2 S	1636.8	1638.6	2.4	10.3	6.2		
	4995	ATHN	2 S	1636.9	1638.6	3	4.5	2.7		
	9100	ARCE	1	1638.5	1638.9	1				
	2800	OTTA	22 GRF	1800	1830	90	3.2	1.6		

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JUNE 1977

JUN 1977	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	2800	OTTA	240 R	1940	2010	30	1.6	0.8		
	4995	BOUL	8 S	2041.5	2042.5	2.5	15	4		
	2800	OTTA	20 GRF	2055	2110	15	2.2	1.1		
	2695	BOUL	45 C	2131	2133	2.5	36	12		
	8800	MANI	3	2207.5	2209.3	3.9	41.3	14.6		
	4995	MANI	3	2207.9	2209.1	3.5	10.4	3.5		
	2695	MANI	3	2207.9	2209	3.5	6.4	1.8		
	9400	HUAN	1 S	2208.7	2209.3	1.3	24.6	8.2		R
	2800	OTTA	20 GRF	2230	2258	110	4.4	1.8		
	3750	TYKW	20 GRF	2235	2255	70	6	2		
25	1420	BOUL	1 S	0050	0050.5	1	1			
	2695	BOUL	3 S	0051	0051.5	1.5	2	1		
	200	GORK	44 NS	0306		414 D		5		
	260	ONDR	44 NS	0610 E		530 D	84			
	127	TORN	44 NS	0720 E	1326.2	460 D	77			V=1
	245	SGMR	43 NS	1200	2158.3	740 D	30.8			
	207	VORO	44 NS	2100	2243	240	27	9		
	3100	CRIM	26 FAL	0530	0634		5			
	3100	CRIM	20 GRF	0738	0755	25	2.5	1		
	3100	CRIM	24 R	0830	1055		6			
	5730	IRKU	1 S	0830.5	0831	1	2.6			
	5730	IRKU	1 S	0850.2	0850.3	1	3.5			R
	9100	ARCE	21	1024.9	1048.6	120				
	2800	OTTA	20 GRF	1048	1053	60	3.6	1.8		
	8800	ATHN	4 S	1050.7	1052.7	9.7	77.1	23.1		
	9500	BERL	3	1051	1051.8	22	68			
	3000	BERL	3	1051	1052.5	10	6.7			
	4995	ATHN	3 S	1051.1	1052.7	8.1	38.1	11.4		
	9100	ARCE	4	1051.3	1052.7	3.6				
	4995	SGMR	4 S/F	1051.6	1052.6	5.6	20	8		
	9100	ARCE	29	1054.9		19.5				
	228	HARS	45 C	1237	1240.3	4	60	11		
	410	SGMR	6 S	1239.8	1240.3	.9	69	21		
	536	ONDR	4 S/F	1239	1240	2	39			
	606	SGMR	3 S	1240	1240.4	.9	44.4	13.3		
	245	SGMR	6 S	1240	1240.3	.7	193	58		
	7000	SAOP	28 PRE	1357.7	1357.8	.3	9.6	5.7		
	7000	SAOP	46 C	1357.9	1358.1	2.3	33.1	16.2		
	9100	ARCE	21	1411.7	1504.5	135				
	8800	ATHN	13 S	1455.1	1457.9	4.7	23.9	7.2		
	4995	ATHN	3 S	1455.2	1458	4.6	14.3	4.3		
	4995	SGMR	3 S	1457.6	1459.3	3.4	14.7	7.4		
	2800	OTTA	45 C	1457.9	1459.1	3	5.4	3.8		
	9100	ARCE	40	1457.9	1459.4	2.6				
	1420	ARCE	40	1457.9	1458.3	1.6				
	2800	OTTA	21 GRF	1457	1504	105	3.6	2		
	1415	SGMR	3 S	1458	1458.5	1.1	12.5	6.2		
	2695	SGMR	3 S	1458.3	1459.4	2.8	13.6	6.8		
	8800	SGMR	3 S	1458.3	1458.4	1.7	20.1	10		
	2695	BOUL	45 C	1458	1500	3.5	9	3		
	8800	ATHN	13 C	1459 E	1459		23.9			
	9400	HUAN	1 S	1502	1504.5	12.9	18	3.6		O
	4995	ATHN	3 S	1541.2	1541.5	6.9	7.1	2.1		
	8800	ATHN	3 S	1541.2	1541.5	7.2	16	4.8		
	9100	ARCE	2	1541	1541.9	6				
	4995	ATHN	3 S	1549.6	1549.7	.8	4.8	1.4		
	8800	ATHN	3 S	1549.6	1549.7	1.3	8	2.4		
	237	TRST	41 F	1648.2	1648.4	.2	284			
	228	HARS	45 C	1650.8	1652.6	3.7	150	40		
	237	TRST	41 F	1652.2	1652.4	.4	422			
	410	SGMR	6 S	1652.4U	1658.5U	6.2U	21.9U	6.5U		
	245	SGMR	7 C	1652.4U	1658.5U	9.3U	354 J	106 U		
	237	TRST	41 F	1653	1653.7	1	737			
	237	TRST	41 F	1658.4	1658.5	.6	333			
	7000	SAOP	21 GRF	1750	1756.3	40.6	16.8			
	2800	OTTA	21 GRF	1750	1810	90	3.8	1.9		
	7000	SAOP	2 S	1755.3	1756.3	2.8	10.6	5.6		
	245	SGMR	6 S	1755.9	1756	2.7	161	48.2		
	1420	BOUL	3 S	1755	1756	3.5	2	1		
	2800	OTTA	2 S/F	1755	1756.1	4	9.6	3.2		
	2695	BOUL	8 S	1756.5	1757.5	3	9	3		
	2800	OTTA	32 ABS	2040	2050	70	-1.8	-0.9		
	9400	TYKW	5 S	2218	2218.3	5	7	2		OL
	1000	TYKW	45 C	2241	2243.2	3	11	1		
	500	HIRA	45 C	2242	2242.6	2	22	12		WR
	2695	PENT	240 AR	2250	2543	173	11.8	5.4		
	3750	TYKW	21 GRF	2310	2640	440	10	5		
	3750	TYKW	45 C	2314	2324	16	5	2		
	9400	TYKW	5 S	2321	2324.8	20	19	7		OL
	2695	PENT	1 S	2323.2	2324	7	1.8	1		
	2000	TYKW	5 S	2323.7	2324.2	1	2.5	.6		OR
	2000	TYKW	21 GRF	2350	0240	430	7	2.5		OR
	9400	TYKW	20 GRF	2355	0200	260	21	10		OL
26	1000	TYKW	20 GRF	0110	0235	170	5	1		

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JUNE 1977

JUN 1977	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
26	200	GORK	44 NS	0300		420		5		
	260	ONDR	44 NS	0610 E		540 D	15			
	5730	IRKU	1 S	0342.2	0343	2	3			L
	5730	IRKU	1 S	0406	0407.1	2	3			R
	9400	TYKW	21 GRF	0425	0535	120	11	6		OL
	2000	TYKW	5 S	0439	0439.9	4	1	.3		OR
	3750	TYKW	5 S	0439	0439.8	3	8	2 D		
	9100	GORK	20 GRF	0452.5	0457	16	9.5	3.3		
	3750	TYKW	5 S	0452	0453.3	9	3	1		
	9400	TYKW	5 S	0452	0453.3	9	7	3		OL
	9100	GORK	20 GRF	0541	0810.6	221 D	18.8	7.6		
	3100	CRIM	1 S	0705	0707.5	5	2	1		
	8800	ATHN	2 S	0759.8	0804.4	10.3	5.5	3.3		
	4995	ATHN	2 S	0801.7	0804.6	9.1	6.5	4		
	3100	CRIM	5 S	0802	0804	10	3	1		
	3100	CRIM	20 GRF	0838	0915	38	4	1		
	127	TORN	48 C	0933 U	1001.5	45	54			
	127	TORN		0943.4E	0943.4		39			
	15000	KISV	45 C	0950	1014	45	76 D			
	8800	ATHN	4 S	1010.1	1015.1	26.3	134.3	40.3		
	9100	ARCE	28	1010.4	1012.1	4.1				ATMOS. ATTEN.
	9500	BERL	46	1010	1014.7	35	95	18		
	4995	ATHN	4 S	1012.1	1015.4	24.9	68.2	20.5		
	3100	CRIM	2 S	1014	1015	2	14	5		
	3100	CRIM	29 PBI	1016	1021	27	5.5	2		
	9100	ARCE	3	1014.5	1015.2	2.5				
	3000	BERL	3	1014	1014.7	31	16	2.5		
	9100	ARCE	29	1017		16.5				
	808	ONDR	2 S/F	1241.3	1241.3	1.5	32			
	2800	OTTA	27A RF	1255		385	3.6	3		
	2800	OTTA	24 R	1255	1315	20	3.6	1.8		
	2800	OTTA	24P R	1315		260	3.6			
	2800	OTTA	21 GRF	1323		42	4.2	3.1		
	1420	ARCE	20	1331.3	1337.8	20.6				
	4995	SGMR	4 S/F	1333.1	1336.8	26.9U	123.1	49.2U		SID,SWF
	4995	ATHN	2 S	1333.4	1336.9	18.2	140	42		
	8800	ATHN	2 S	1334.7	1337.3	16.7	102.2	30.7		
	7000	SAOP	4 S/F	1334.8	1337.2	4.3	101.4	53.2		
	7000	SAOP	29 PBI	1339.1		11.4	19			
	9100	ARCE	4	1334	1337.1	5.2				ATMOS. ATTEN.
	4995	BOUL	8 S	1334	1336.5	5	123	41		
	8800	SGMR	4 S/F	1335.2	1336.2	24.5U	81.6	32.6U		SID,SWF
	2695	SGMR	3 S	1335.3	1336.8	24.7U	39.9	16 U		SID,SWF
	9400	HUAN	45 C	1335.3	1337	3.1	83.3	34.9		L
	9400	HUAN	29 PBI	1338.4	1338.4	9.2	22.9	10		L
	9500	BERL	4	1335	1336.5	20	68	14		
	1470	BERL	1	1335	1337.5	18	2.4			
	3000	BERL	4	1335	1336.5	28	58	10		
	2695	BOUL	3 S	1335	1337.5	14	34	11		
	2800	OTTA	4 S/F	1335	1337.1	15	48	11		
	9100	ARCE	29	1339.2	1340.8	17.5				
	4995	BOUL	8 S	1355.5	1358	3	73	24		
	1420	ARCE	21	1357.7	1507.5	165				
	9100	ARCE	22	1413.4	1438.6	46				
	2800	OTTA	21 GRF	1421.5	1436	118	26.8	7.7		
	7000	SAOP	25 R	1425.3			23.5			
	3000	BERL	20	1425	1454	55	14			
	4995	ATHN	2 S	1430.7	1438.3	67.9	29.8	8.9		
	8800	ATHN	2 S	1430.7	1438.5	57.4	23.6	14.1		
	9500	BERL	20	1430	1439	50	16			
	1470	BERL	20	1431.5	1502	49	3.7			
	1420	ARCE	40	1432.6	1435.7	10.5				
	3000	BERL	4	1433.5	1438	18	34			
	1470	BERL	46	1433.5	1435.7	3	7.8			
	1420	BOUL	45 C	1433.5	1455	2.5	6	3		
	2800	OTTA	1 S	1434	1434.4	1	3.6	1.8		
	2695	BOUL	4 SF	1435.5	1439	15	15	5		
	2800	OTTA	2 S/F	1437.5	1438	1.5	7.6	3.4		
	113	BERL	2	1438	1438.1	.2	700	100		
	7000	SAOP	45 C	1438	1438.1	.5	5.6	3.8		
	8800	ATHN	3 S	1504.6	1510.5	11.7	21	6.3		
	4995	ATHN	3 S	1505	1510.6	22.8	22.8	6.8		
	2800	OTTA	21 GRF	1505	1510	35	3.8	1.9		
	2800	OTTA	1 S	1509.5	1510.6	2	7.4	3		
	3000	BERL	3	1509.5	1510.2	5.5	22			
	9100	ARCE	3	1509.9	1510.5	2.6				
	7000	SAOP	4 S	1510	1510.1	.4	20.2	12.1		
	7000	SAOP	29 PBI	1510.4		.8	7.3			
	9400	HUAN	45 C	1510	1510.5	3.4	16.3	5.7		O
	2695	BOUL	1 S	1510.5	1511.5	3.5	6	2		
	9500	BERL	3	1510	1510.2	7	30			
	4995	BOUL	2 SF	1515	1519	6.5	101	34		
	606	SGMR	4 S/F	1543.5	1547.8	6.7	77.8	23.3		SID,SWF
	4995	ATHN	3 S	1545.1	1549	29.2	40.3	12.1		
	7000	SAOP	28 PRE	1545.2	1547	2.1	5.4			

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JUNE 1977

JUN 1977	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	7000	SAOP	4 S/F	1547.3	1549	3.1	63.8	33.2		
	7000	SAOP	29 PBI	1550.4		17.3	14.6			
	8800	ATHN	4 S	1545.3	1549.1	29	62.9	18.9		
	9400	HUAN	28 PRE	1545.4	1547.5	2.1	13.1	5.9		R
	9400	HUAN	45 C	1547.5	1549.2	2.3	71.9	39.8		R
	9400	HUAN	29 PBI	1549.8	1549.8	2.9	18	8.2		R
	1420	BCUL	23 GRF	1546.5	1548.5	21.5	30	9		
	4995	SGMR	4 S/F	1547.2	1548.8	31.8	46	13.8		SID,SWF
	2695	PENT	4 S/F	1547.2	1549	5.8	70	24		
	2800	OTTA	29 PBI	1553	1553	25	5.2	2.6		
	2695	SGMR	4 S/F	1547.3	1548.9	31.7	64	19.2		SID,SWF
	1415	SGMR	4 S/F	1547.3	1549.1	7.7U	36.8	11.1U		SID,SWF
	9100	ARCE	4	1547.3	1549.1	3				
	8800	SGMR	4 S/F	1547.5	1549	31.5	51	15.3		SID,SWF
	1420	ARCE	4	1547	1548.7	3.8				
	9100	ARCE	29	1550.3		27.5				
	1420	ARCE	29	1550.8		14				
	9100	ARCE	8	1716.2	1716.4	.6				
	7000	SAOP	8 S	1716.2	1749.4	.4	14	7		
	2800	OTTA	26 FAL	1735	1920	105	-3	-1.5		
	2800	OTTA	21 GRF	1950	2105	210	3.6	2.2		
	207	VORO	44 NS	2100		240		11		
	4995	BOUL	8 S	2125.5	2127	3	22	7		
	1000	TYKW	42 SER	2125.5	2127.2	3.5	55	5		
	9400	HUAN	1 S	2126.1	2127.3	4	29.4	9.3		R
	4995	SGMR	3 S	2126.4	2127.2	5.7	30.4	9.1		
	2695	SGMR	3 S	2126.4	2127.3	5	23.4	7		
	2800	OTTA	3 S	2126.5	2127.2	2.5	22	7.3		
	2800	OTTA	29 PBI	2129	2129	10	2	1		
	8800	SGMR	3 S	2126.6	2127.4	4.6	24.4	7.3		
	1420	BCUL	3 S	2126	2127.5	3	4	1		
	1415	SGMR	1 S	2127	2127.5	2.6	4	1.2		
	2695	BOUL	8 S	2127	2128	3	20	7		
	2695	SGMR	3 S	2152.2	2153.1	5.8	12.4	3.7		
	4995	SGMR	3 S	2152.4	2153.1	5.3	14.7	4.4		
	2695	BCUL	8 S	2152.5	2154	6	14	5		
	1415	SGMR	1 S	2152.7	2153.2	2.7	1.5	.5		
	1420	BCUL	3 S	2152	2153	2	2	1		
	4995	BCUL	8 S	2152	2152.5	3.5	15	5		
	9400	TYKW	5 S	2152	2153	6	6	2		OL
	2000	TYKW	5 S	2152	2153.2	3	7 J	2 U		OR
	3750	TYKW	5 S	2152	2153.1	3	15	3		OL
	2800	OTTA	3 S	2152	2153	2	15.2	7		
	2800	OTTA	29 PBI	2154	2154	5	3.6	1.8		
	4995	SGMR	4 S/F	2215.4	2217.9	5.9	51.8	15.5		SID,SWF
	8800	SGMR	4 S/F	2215.7	2218.1	21.4	239.1	71.7		SID,SWF
	9400	HUAN	45 C	2216.1	2218	3.9	259.8	85		R
	8800	MANI	4	2216.8	2217.9	3.1	285	91		2-SPA
	4995	MANI	3	2216.8	2217.9	3.1	46.5	14.9		
	4995	BOUL	8 S	2216	2217	4	48	16		
	3750	TYKW	5 S	2216	2217.9	4	7	2		OL
	9400	TYKW	5 S	2216	2217.9	4	305	80		05L
	9400	TYKW	29 PBI	2220		60	15	3		
	1000	TYKW	42 SER	2255	2255.5	2	12	2		
27	3750	TYKW	20 GRF	0123	0135	90	6	3		OL,095054F
	9400	TYKW	21 GRF	0123	0128	55	12	6		OL
	9400	TYKW	5 S	0142 U	0146 U	15 U	20 U	6 U		OL,RAIN
	100	GORK	44 NS	0300 E		560 D		5		
	200	GORK	44 NS	0300 E		540		5		
	260	ONDR	44 NS	0606 E		542 D	27			
	127	TORN	44 NS	0640 E	1005.6	500 D	21			V=1
	160	DWIN	44 NS	0850		306		10		
	169	DWIN	44 NS	0850		306		10		
	9100	GORK	21 GRF	0337 E	0531.8	210.3E	39	9.6		
	2000	TYKW	21 GRF	0340	0438	170	4.5	1.7		OR
	3750	TYKW	28 PRE	0343	0353	34	8	5		OL,095054F
	3750	TYKW	45 C	0417	0418.3	7	22	14		OL,095054F
	3750	TYKW	29 PBI	0424		50	11	7		OL,275035F
	9400	TYKW	28 PRE	0343	0404	34	11	6		OL
	9400	TYKW	45 C	0417	0421	7	40	20		OL
	9400	TYKW	29 PBI	0424		50	20	13		
	5730	IRKU	45 C	0344	0346.2	10	6			
	5730	IRKU		0344	0353		16			L
	5730	IRKU	30 PBI	0354		23	5			
	1415	MANI	2	0351.5	0352.2	2.7	2.5	.5		
	2695	MANI	2	0351.5	0352.2	2.7	3.3	.8		
	4995	MANI	2	0351.5	0352.2	2.5	5.7	1.9		
	2000	TYKW	5 S	0352.7	0353.2	2.5	3	1		OR
	4995	MANI	2	0415	0419	9.5	18	5.6		
	2695	MANI	2	0415	0417.2	7	10	4.2		
	8800	MANI	2	0415.5	0420.2	10.5	24.9	8.3		3-SPA
	2000	TYKW	5 S	0416.5	0418.2	15	4	1.5		OR
	4995	ATHN	2 S	0417.5	0419.9	24.9	17.2	10.3		
	5730	IRKU	45 C	0417.6	0420	8	15			L

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JUNE 1977

JUN 1977	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	MEAN	INT	POLARIZATION OR REMARKS
27	5730	IRKU		0417.6	0421		15			L
	5730	IRKU	29 PBI	0425		25	10			
	8800	ATHN	2 S	0418.2	0421.1	20.7	36.1	21.7		
	9100	GORK	45 S	0418.6	0420	3.9	13.7			
	9100	GORK		0418.6	0421		18			
	606	MANI	1	0419.3	0424	10.7	29.6	5.1		
	8800	ATHN	2 S	0501.2	0516.9	74.8	23.2	13.9		
	4995	ATHN	2 S	0504.5	0525.5	64.3	17.2	10.3		
	3750	TYKW	28 PRE	0514	0517	12	13	8		OL
	3750	TYKW	45 C	0526	0527.7	9	30	15		OL
	3750	TYKW	38 PBI	0535		185	11	4		
	9400	TYKW	28 PRE	0514	0517	12	18	14		OL
	9400	TYKW	45 C	0526	0528.6	9	155	45		OL
	9400	TYKW	38 PBI	0535		105	28	9		
	5730	IRKU	28 GRF	0514	0518	6	7			R
	2800	TYKW	45 C	0515	0526	55	3	1		OR
	5730	IRKU	45 C	0523.5	0527.5	9	55			R
	5730	IRKU		0523.5	0528.5		55			R
	5730	IRKU	29 PBI	0533		37	24			
	2695	MANI	2	0525.2	0526.8	4.8	2.5	.8		
	4995	MANI	14	0525.2	0527.8	7.8	55	18.9		
	8800	MANI	14	0525.4	0527.8	9.6	122	55		3-SPA
	1000	TYKW	45 C	0525	0525.6	5	1.8	.8		
	3100	CRIM	2 S	0526	0531	14	9	3		
	8800	ATHN	13 C	0526.4	0527.5	15	110.9	33.3		
	9100	GORK	45 S	0526.6	0527.5	3.4	95			
	9100	GORK		0526.6	0528.6		128			
	4995	ATHN	13 C	0526.7	0527.6	10.2	51.5	15.4		
	8800	MANI		0526.7E	0526.7		89			
	4995	MANI		0526.7E	0526.7		53			
	4995	ATHN	13 C	0528.6E	0528.6		56.4	16.9		
	8800	ATHN	13 C	0528.7E	0528.7		147.1	44.1		
	3100	CRIM	28 GRF	0620	0627	24	5	2		
	3750	TYKW	45 C	0620	0622.6	20	8	3		OL
	9400	TYKW	5 S	0622	0625	18	4	2		OL
	8800	ATHN	2 S	0631.5	0640.5	41.8	7.7	2.3		
	4995	ATHN	2 S	0631.7	0635.6	35.2	2.5	.7		
	3100	CRIM	24 R	0731	0857		4			
	9100	GORK	28 GRF	0736	0752.3	117	7.4	3.1		
	9100	GORK	28 GRF	0951.5	1014.3	129.5D	13.7	4.9		
	8800	ATHN	2 S	1014.1	1016.2	13.1	7.7	4.6		
	29	UPIC	8 S	1042	1042.1	.4				
	33	UPIC	8 S	1042	1042.1	.4				
	29	UPIC	45 C	1114.3	1115	2.2				
	33	UPIC	45 C	1114.5	1115.2	2.9				
	536	ONDR	8 S	1118.3	1118.4	.3	20			
	9100	ARCE	22	1141.9	1150.6	15.8				
	29	UPIC	2 S/F	1157.4	1158.1	1.3				
	33	UPIC	2 S/F	1157.4	1157.9	1.7				
	2800	OTTA	24 R	1322	1350	18	1.6	0.8		
	2800	OTTA	27A RF	1322		168	1.6	1.4		
	2800	OTTA	24P R	1350		130	1.6			
	33	UPIC	4 S/F	1423.4		.8				
	29	UPIC	2 S/F	1423.5	1423.8	1				
	1420	ARCE	1	1451.7	1452	.8				
	237	TRST	41 F	1451.8	1452.2	.5	180			
	606	SGMR	1 S	1451.8	1452	.5	7.5	2.3		S,SID
	113	POTS	45 C	1452	1452	.2	550	100		
	536	ONDR	2 S/F	1452.2	1452.2	1	10			
	1415	SGMR	1 S	1452.2	1452.3	.3	5.9	1.8		S,SID
	418	SGMR	7 C	1452.3	1452.5	.7	428	129		S,SID
	808	ONDR	1 S	1452.3	1452.3	.2	10			
	260	ONDR	8 S	1452.3	1452.3	.4	219			
	29	UPIC	45 C	1452	1452.4	.9				
	33	UPIC	45 C	1452	1452.2	1				
	7000	SAOP	23 GRF	1500.4	1541.6	64.8	33.8			
	9100	ARCE	20	1500.7	1541.6	79.3				
	9100	ARCE		1500.7	1505.1	38.3				
	4995	SGMR	20 GRF	1500.7	1502.6	38.6	10.6	3.2		
	8800	ATHN	2 S	1501	1502.9	14.3	10.5	6.3		
	4995	ATHN	2 S	1501	1502.9	25.9	8	4.8		
	2695	SGMR	20 GRF	1501.4	1502.8	55.8	8.7	2.6		
	8800	SGMR	20 GRF	1501.8	1504.9	37.1	16.3	4.9		
	2800	OTTA	1 S	1501	1503	4	6	3		
	2800	OTTA	29 PBI	1505	1505	25	3.8	1.9		
	2695	BCUL	23 GRF	1503	1504	6	5	2		
	237	TRST	41 F	1504.1	1504.1	.2	88			
	260	ONDR	8 S	1504.2	1504.2	.3	128			
	29	UPIC	4 S/F	1508.1	1509	1				
	33	UPIC	4 S/F	1508	1508.7	.9				
	9400	HUAN	1 S	1538.7	1541.5	9.9	26.2	11.6		R
	7000	SAOP	4 S/F	1538.8	1541.5	6.2	27.1	16.1		
	7000	SAOP	29 PBI	1545		9	10.2			
	4995	ATHN	2 S	1538.8	1543.5	11.4	5.4	3.2		
	8800	SGMR	20 GRF	1538.9	1541.6	11.6	36.7	11		SID

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JUNE 1977

JUN 1977	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	4995	SGMR	20 GRF	1539.3	1541.4	12.5	7.1	2.1		SID
	8800	ATHN	2 S	1539.4	1541.5	11.6	26.2	15.7		
	9100	ARCE		1539	1541.6	41				
	2800	OTTA	26 FAL	1550	1610	20	-1.6	-0.8		
	2695	PENT	1 S	1651	1652	4.5	1.6	0.8		
	2800	OTTA	20 GRF	1656.5	1700	53	3.8	1.3		
	9400	HUAN	1 S	1730.4	1738.7	18	9.8	3		O
	7000	SAOP	1 S	1737.8	1739	2.8	7.9	4.8		
	9100	ARCE	1	1738.1	1738.8	2.6				
	2800	OTTA	20 GRF	1750		40	1	0.5		
	9400	HUAN	1 S	1831.5	1836	10.7	9.8	2.9		R
	7000	SAOP	40 F	1843		7.4	3.4			
	9400	HUAN	1 S	1850.7	1851.2	1	49.1	18.8		O
	9400	HUAN	29 PBI	1851.7	1852.1	13.1	19.7	6.6		O
	7000	SAOP	3 S	1850.8	1851.4	2	33.9	19.3		
	7000	SAOP	29 PBI	1852.8		7.4	6.8			
	4995	SGMR	1 S	1850.8	1851.4	6.6	4.4	1.3		
	8800	SGMR	3 S	1851.3	1851.6	6.2	38.4	11.5		
	2800	OTTA	20 GRF	1923	1940	52	1.6	1		
	2800	OTTA	20 GRF	2025	2032	15	0.8	0.4		
	2800	OTTA	240AR	2100	2230	90	2.2	1.1		
	207	VORO	44 NS	2100		240		8		
	2800	OTTA	20 GRF	2120	2155	70	4.2	2.1		
	500	HIRA	45 C	2122	2127.4	10	10	3		O
	2000	TYKW	5 S	2146	2148	3	2.5	.8		OR
	9400	TYKW	5 S	2305	2306	9	6	2		OL
	9400	TYKW	45 C	2316	2325	18	8	3		OL
	2695	PENT	20 GRF	2320	2335	65	3	1.5		
	3750	TYKW	5 S	2323	2324.7	17	3	1		OL
	9400	TYKW	5 S	2351	2356	17	14	4		OL
28	8800	MANI	4	0011.4	0012	5.1	215	52		1-SPA
	4995	MANI	3	0011.4	0012	5.1	37.8	18.9		
	9400	TYKW	45 C	0011.5	0011.8	19	240	12		OL
	2695	PENT	1 S	0054	0057.5	6	1.8	0.9		
	3750	TYKW	5 S	0225	0232	25	4	2		OL,094028F
	9400	TYKW	5 S	0227	0233	25	7	3		OL
	2000	TYKW	5 S	0227	0232	23	1.5	.6		OR
	9400	TYKW	20 GRF	0303	0330	90	8	4		OL
	3750	TYKW	20 GRF	0305	0345	85	5	2		OL
	200	GORK	44 NS	0312		252		5		
	200	GORK	44 NS	0506		294		5		
	260	ONDR	44 NS	0553 E		557 D	60			
	127	TORN	44 NS	0720 E		460 D				V=0
	160	DWIN	44 NS	0744		252		5		
	240	DWIN	44 NS	0744		252		2		
	169	DWIN	44 NS	0744		252		5		
	245	SGMR	44 NS	0913 E	1919.1	907 D	88			
	207	VORO	44 NS	2115		225		11		
	2000	TYKW	20 GRF	0325	0345	105	3.5	1.7		OR
	3100	CRIM	5 S	0710	0718	18	8	3		
	3100	CRIM	29 PBI	0710	0728	20	2	1		
	2000	TYKW	20 GRF	0710	0717	40	4.5	2		OL
	3750	TYKW	20 GRF	0710	0720	40	6	3		OL
	9100	GORK	20 GRF	0715.7	0730	38.3	6	3		
	3100	CRIM	24 R	1005	1040		4			
	2800	OTTA	20 GRF	1440	1520	70	1	0.5		
	2800	OTTA	20 GRF	1730	1810	120	2.4	1.7		
	2695	PENT	20 GRF	2310	2345	70	2.4	1.2		
29	200	GORK	44 NS	0300		540		5		
	260	ONDR	44 NS	0604 E		544 D	8			
	245	SGMR	44 NS	0913 E	1751.4	907 D	37.1J			
	207	VORO	44 NS	2100	2157	240	14	10		
	127	TORN	40 F	0640 E	0645.5	7 D	11			SUNRISE
	33	UPIC	45 C	0752.4	0752.6	2.2				
	29	UPIC	45 C	0752.6	0752.9	2.1				
	29	UPIC	42 SER	1235.7	1247 U	56.9				
	33	UPIC	42 SER	1236.6	1259.8U	55.9				
	2800	OTTA	1 S	1341.5	1342	2	1.4	0.7		
	29	UPIC	4 S/F	1356	1356.1	.3				
	33	UPIC	4 S/F	1356	1356.1	.3				
	2800	OTTA	20 GRF	2100	2113	35	1.6	0.9		
	18	HCMA	42 SER	2201	2204	63			2	
	2800	OTTA	2 S/F	2223	2230	10	1.8	1		
30	9400	TYKW	45 C	0302	0302.2	1	14	4		OL
	3750	TYKW	5 S	0302	0302.3	1	2	1		
	200	GORK	44 NS	0306 E		414		5		
	127	TORN	44 NS	0640 E		500 D				RECORDDISTURBED
	29	UPIC	43 NS	0725.3	0911	418				
	33	UPIC	43 NS	0725.5	1055	418.2				
	260	ONDR	44 NS	0840 E		390 D	22			
	245	SGMR	44 NS	0913 E	2059.4	907 D	50.4			3,CONT
	240	DWIN	44 NS	0946		164		2		

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JUNE 1977

JUN 1977	FREQUENCY	STATION	TYPE		STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} MEAN	INT	POLARIZATION OR REMARKS
30	169	DWIN	44	NS	0946		164		10		
	160	DWIN	44	NS	0946		164		10		
	207	VORO	44	NS	2100	2124	240	15	10		
	3100	CRIM	26	FAL	0740	1020		10			
	8800	ATHN	2	S	1054.7	1058.4	8.1	8.2	4.9		
	4995	ATHN	2	S	1055.7	1056.6	7.9	2.1	1.3		

Reports received from the following observatories:

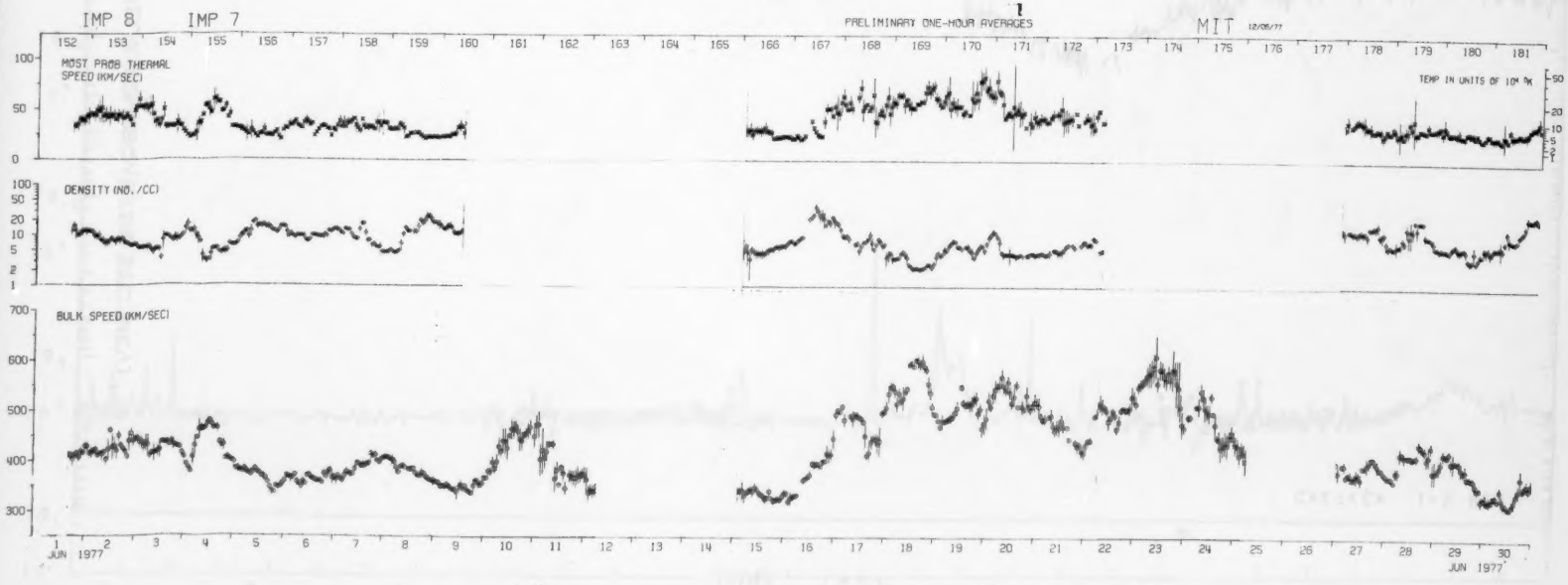
ARCE = Arcetri
BERL = Berlin-Adlershof
BORD = Bordeaux
BOUL = Boulder
CRIM = Simferopol
DWIN = Dwingeloo
GORK = Gorky
HARS = Harestua
HIRA = Hiraiso
HUAN = Huancayo
IRKU = Irkutsk
KIEV = Kiev
MANI = Manila
MCMA = McMath-Hulbert
ONDR = Ondrejov
OTTA = Ottawa
PENT = Penticton
POTS = Potsdam
SAOP = Sao Paulo
SGMR = Sagamore Hill
SYDN = Sydney
TORN = Torun
TYKW = Toyokawa
TRST = Trieste
VORO = Voroshilov (Ussurisk)

Explanation of Type Code:

1 Simple 1
2 Simple 1F
3 Simple 2
4 Simple 2F
5 Simple
6 Minor
7 Minor +
8 Spike
20 Simple 3
21 Simple 3A
22 Simple 3F
23 Simple 3AF
24 Rise
25 Rise A
26 Fall
27 Rise and Fall
28 Precursor
29 Post Burst Increase
30 Post Burst Increase A
31 Post Burst Decrease
32 Absorption
40 Fluctuation
41 Group of Bursts
42 Series of Bursts
43 Onset of Noise Storm
44 Noise Storm in Progress
45 Complex
46 Complex F
47 Great Burst
48 Major
49 Major +

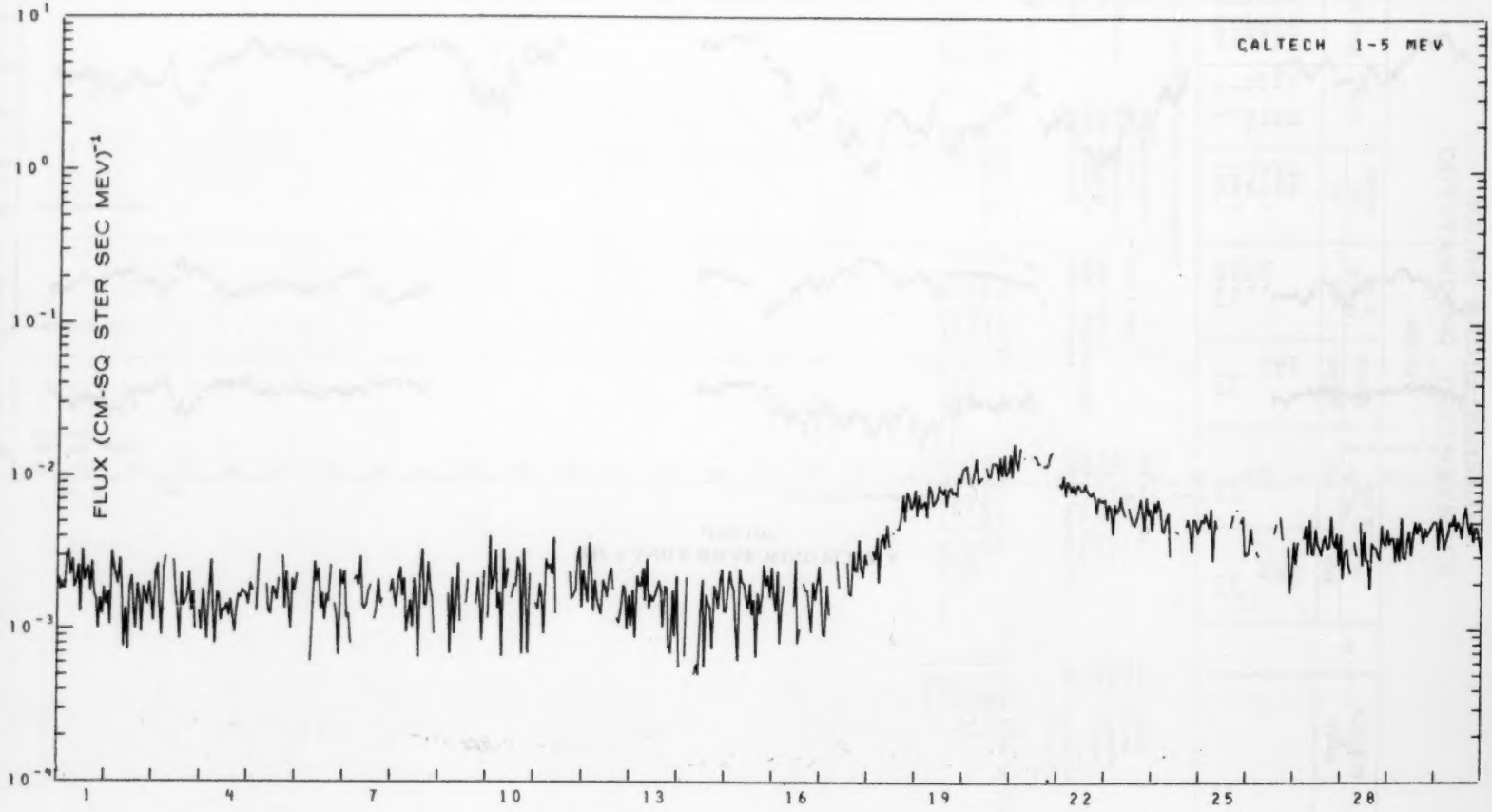
IMP 7 AND 8 SOLAR WIND PLASMA

JUNE 1977



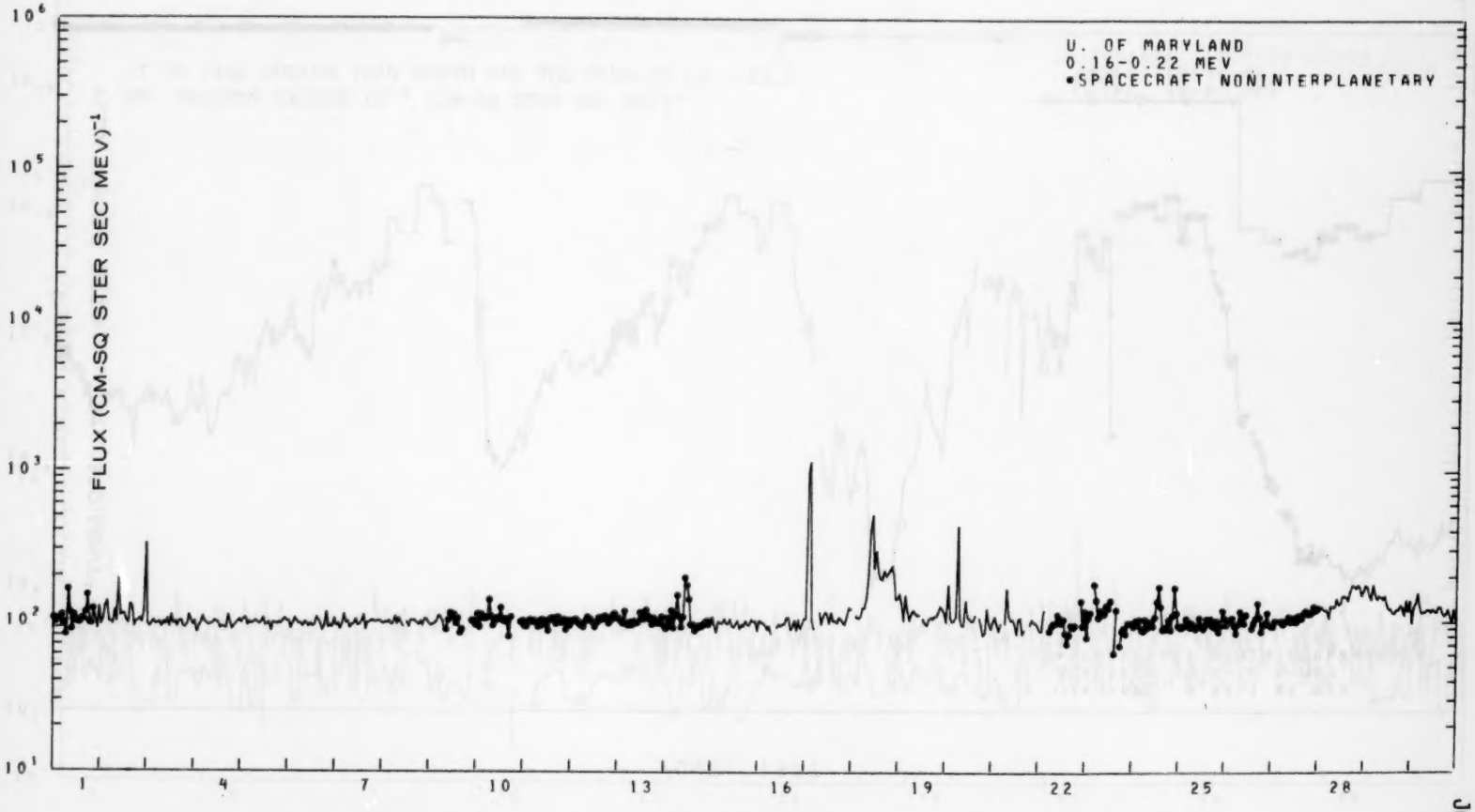
IMP 7 AND 8 ELECTRONS

JUNE, 1977



IMP 7 AND 8 LOW ENERGY PROTONS

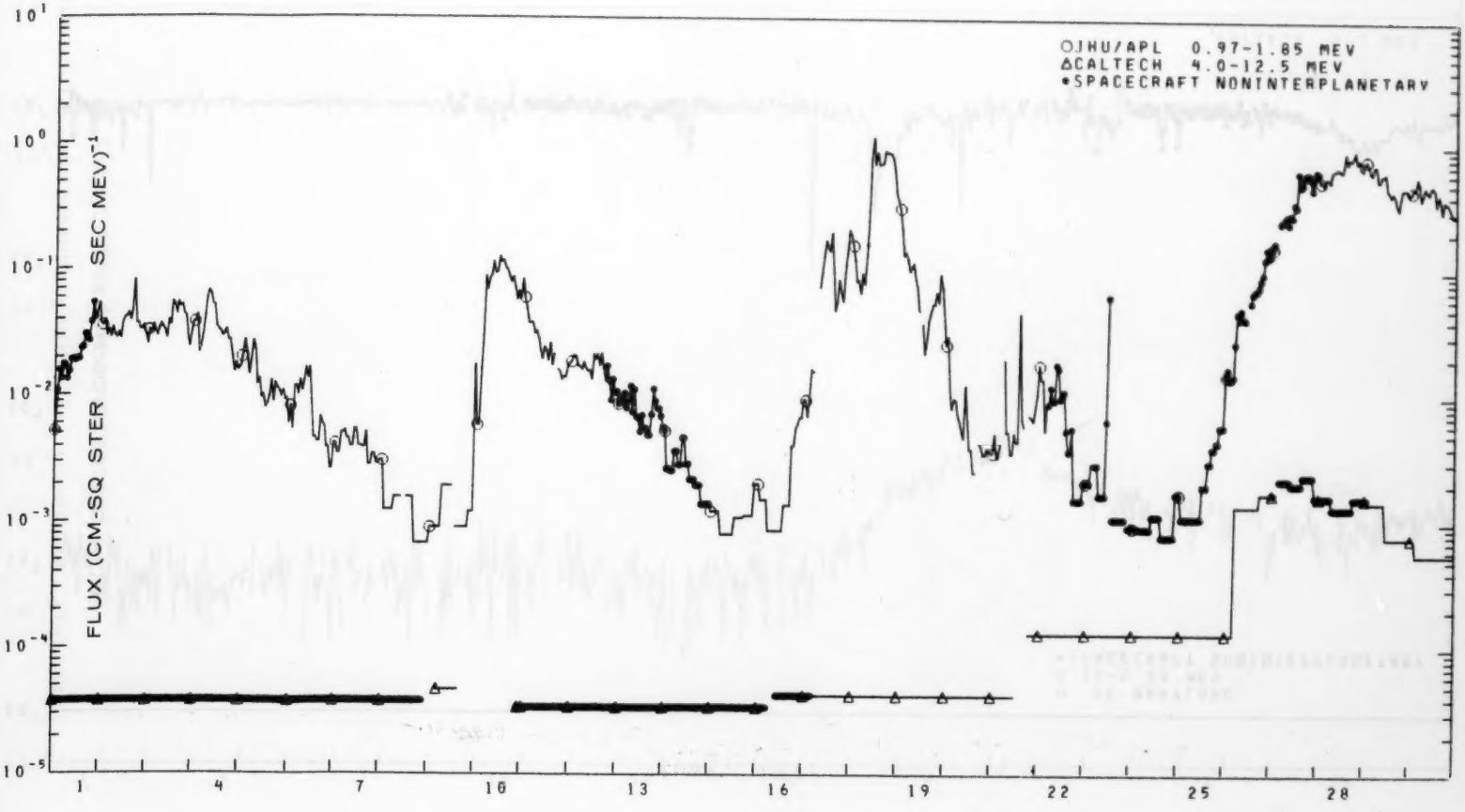
JUNE, 1977



35
Jun 77

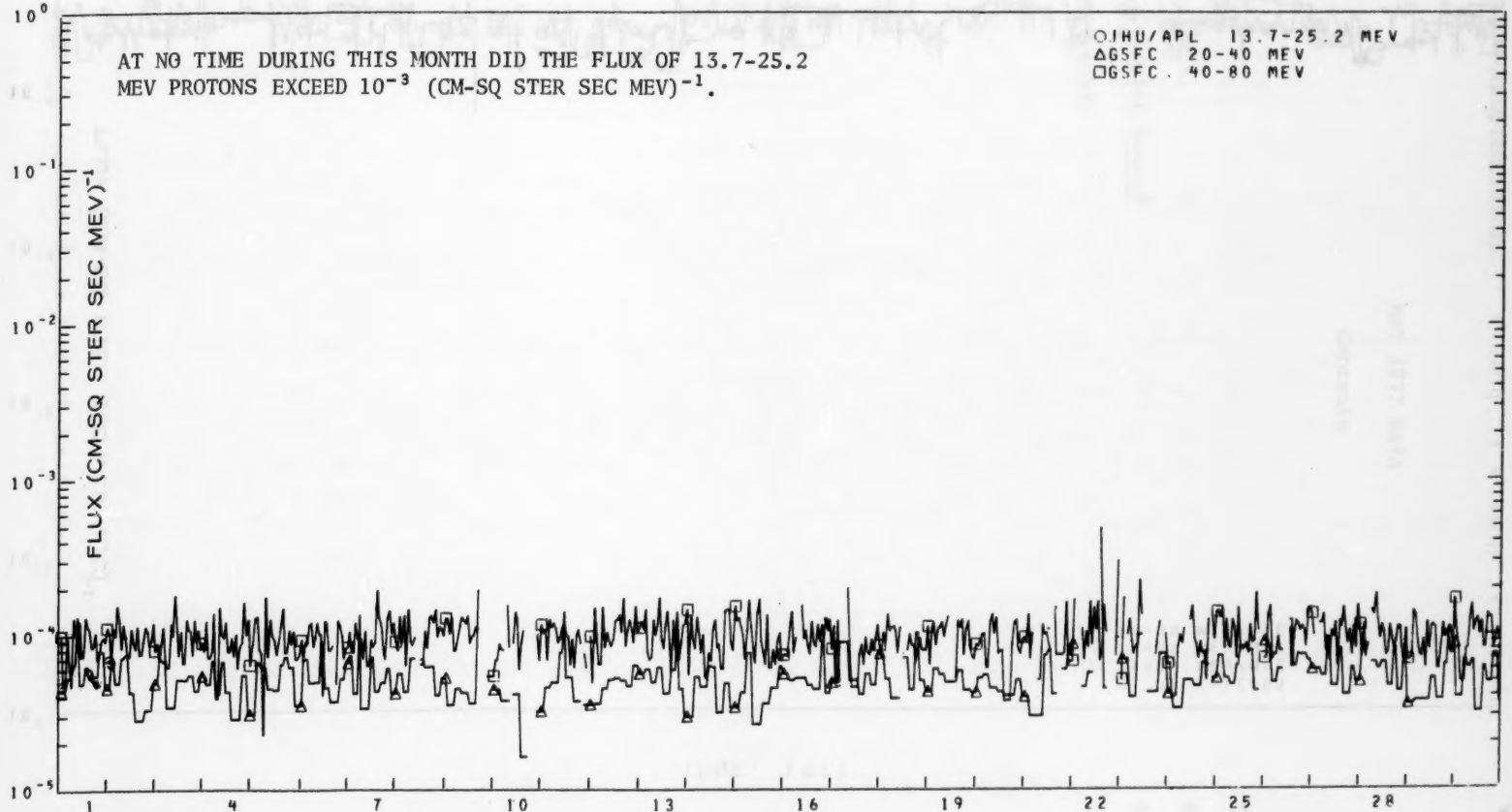
IMP 7 AND 8 INTERMEDIATE ENERGY PROTONS

JUNE, 1977



IMP 7 AND 8 HIGH ENERGY PROTONS

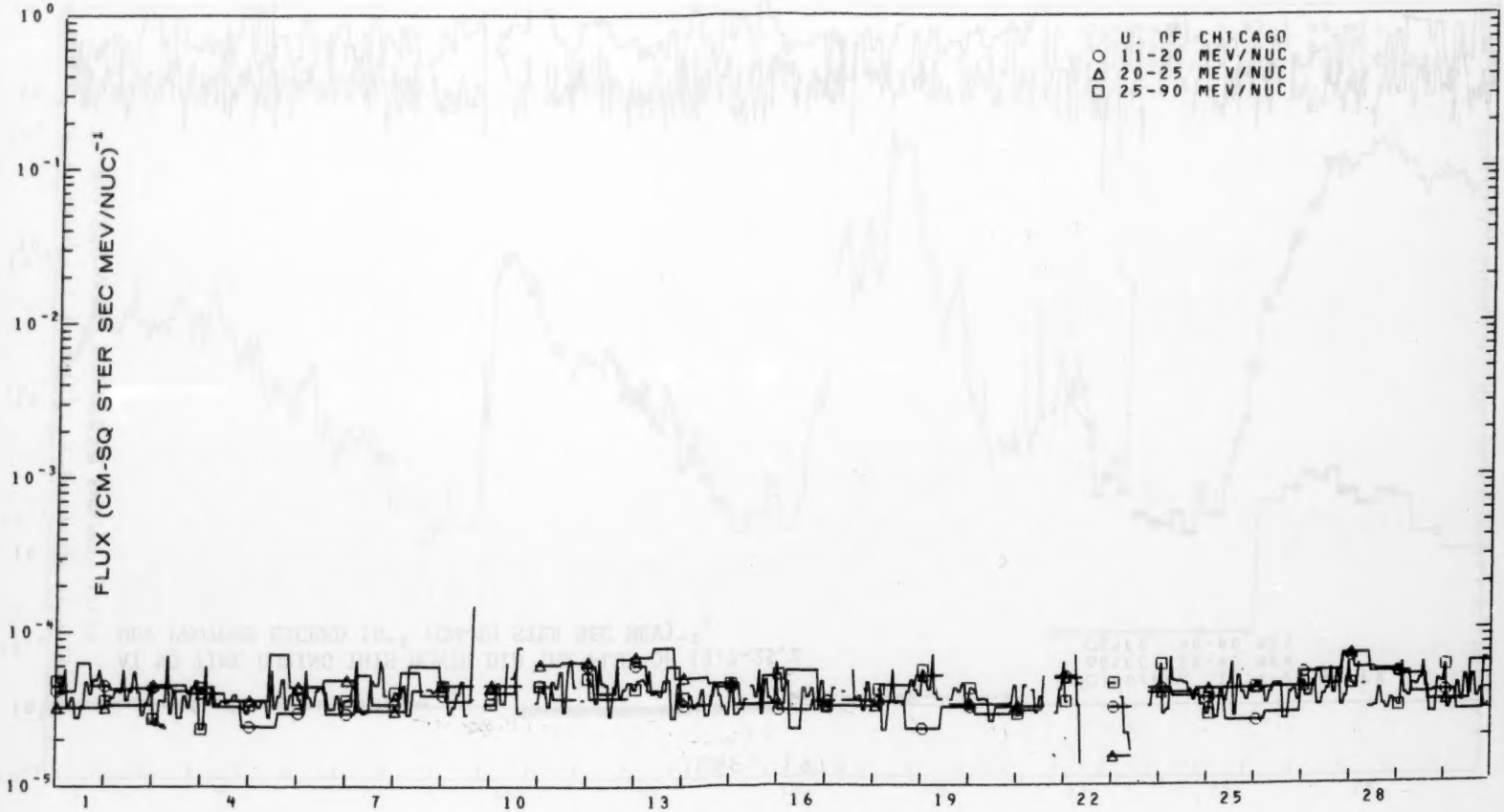
JUNE, 1977



37
Jun 77

IMP 7 AND 8 ALPHA PARTICLES

JUNE, 1977



MAY 1977 DATA

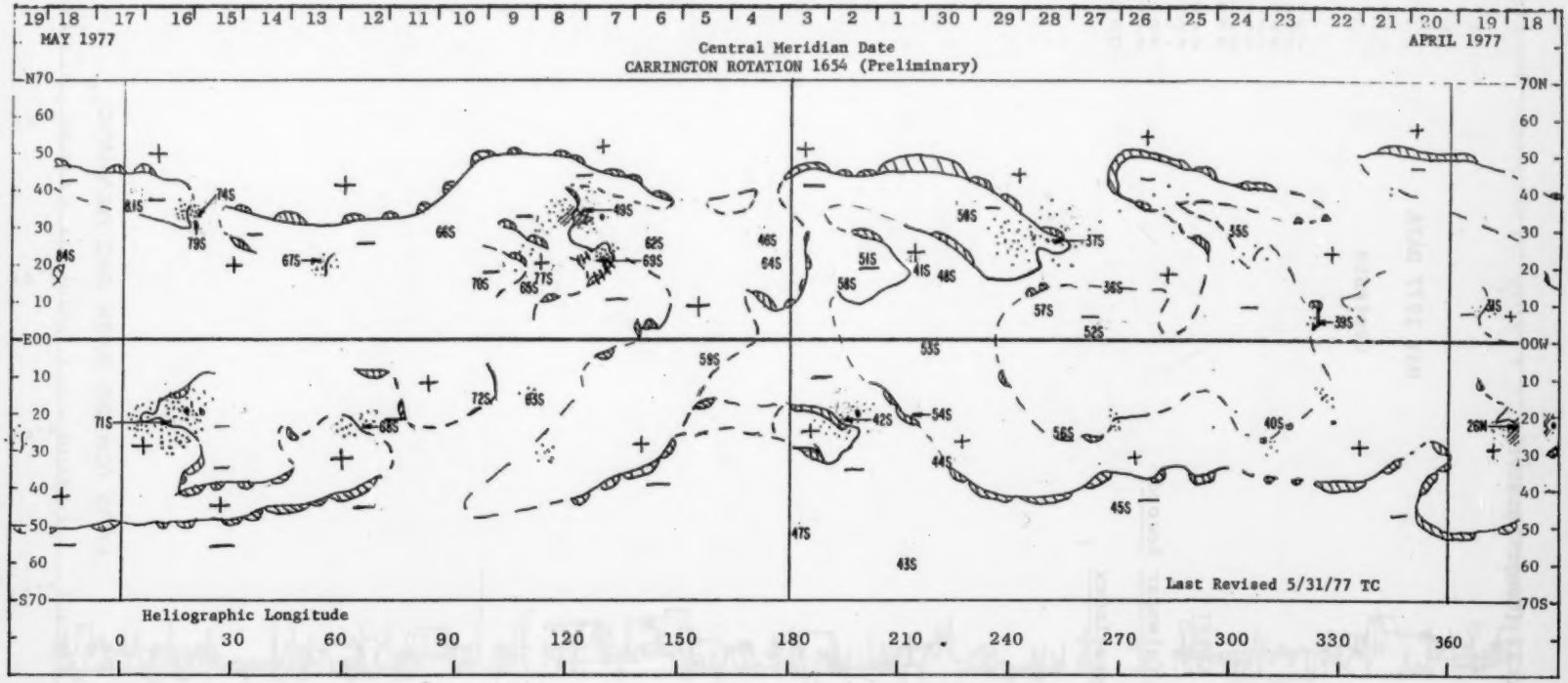
Contents

	Page
Hα Synoptic Chart	40-41
Abbreviated Calendar Record	42-49
Regional Flare Index	49

ABBREVIATED CALENDAR RECORD

Hα SYNOPTIC CHART

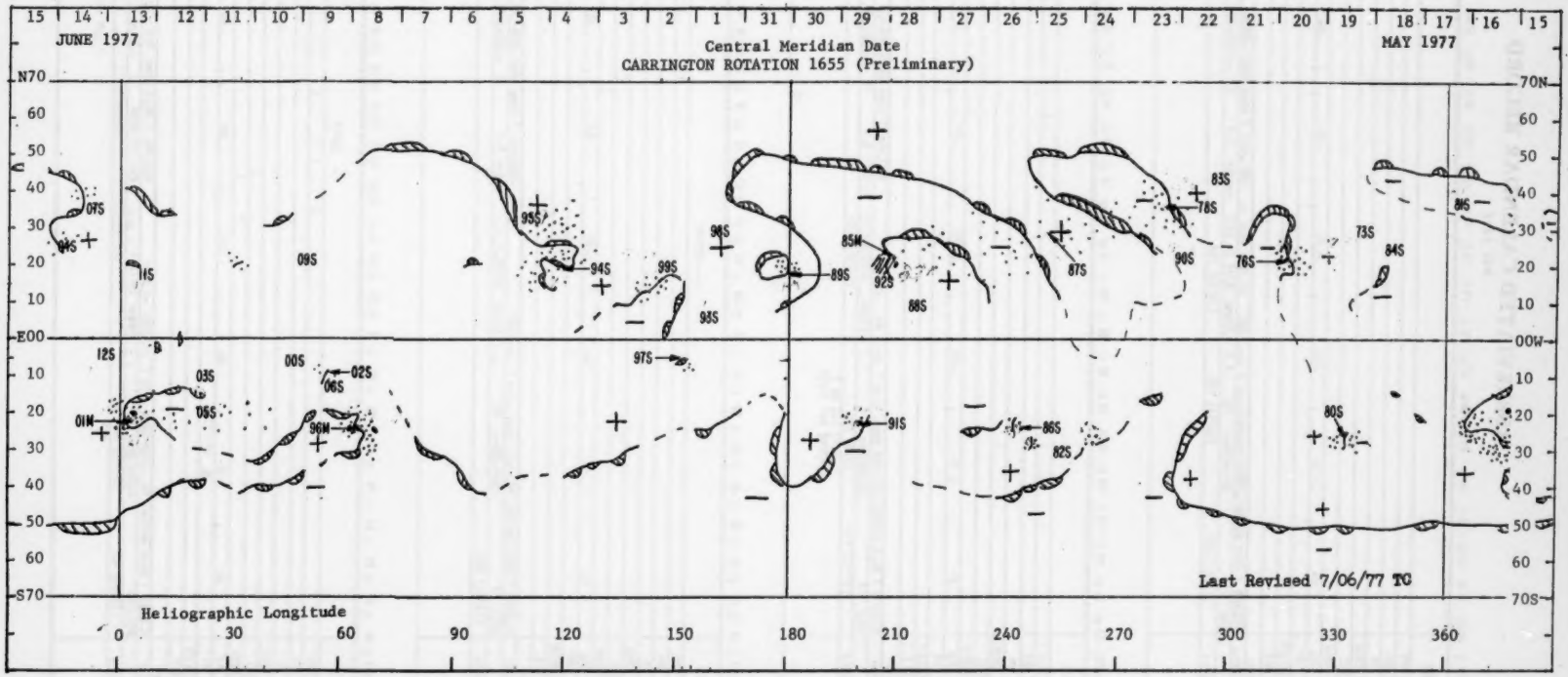
APRIL 1977 - MAY 1977



ABBREVIATED CALENDAR RECORD

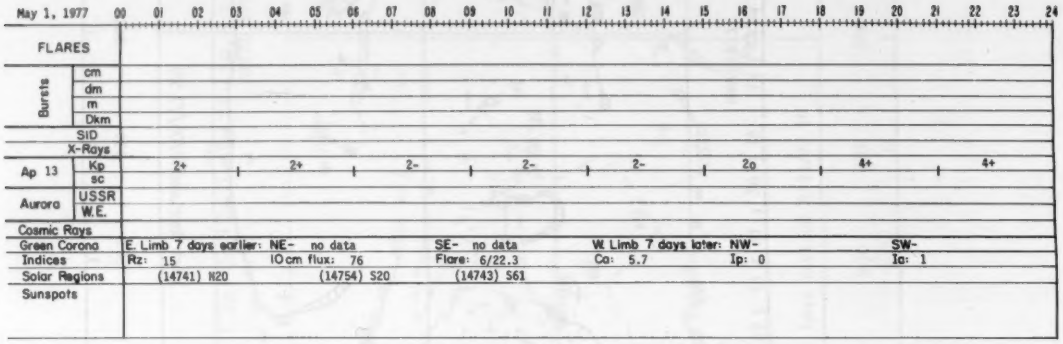
Hα SYNOPTIC CHART

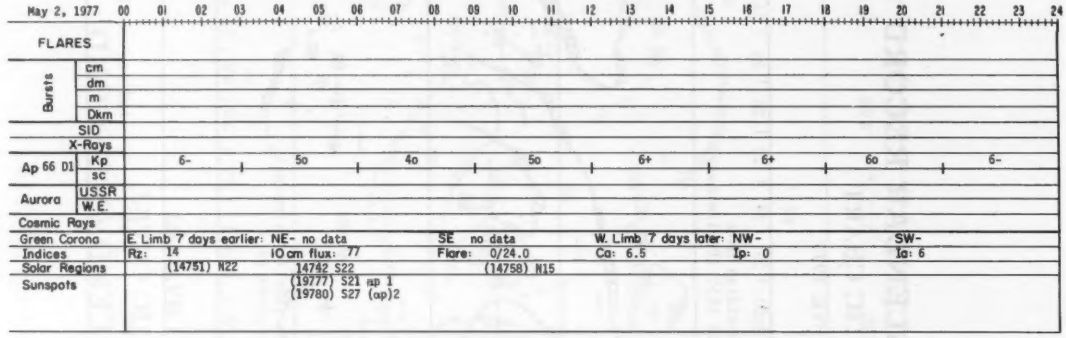
MAY - JUNE 1977

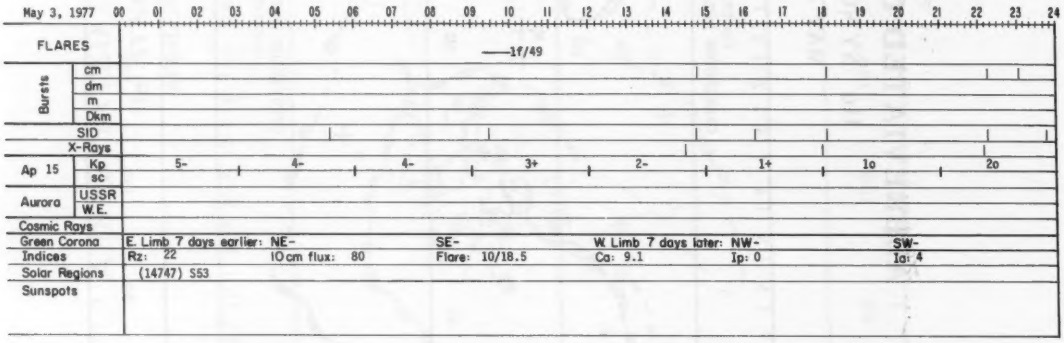


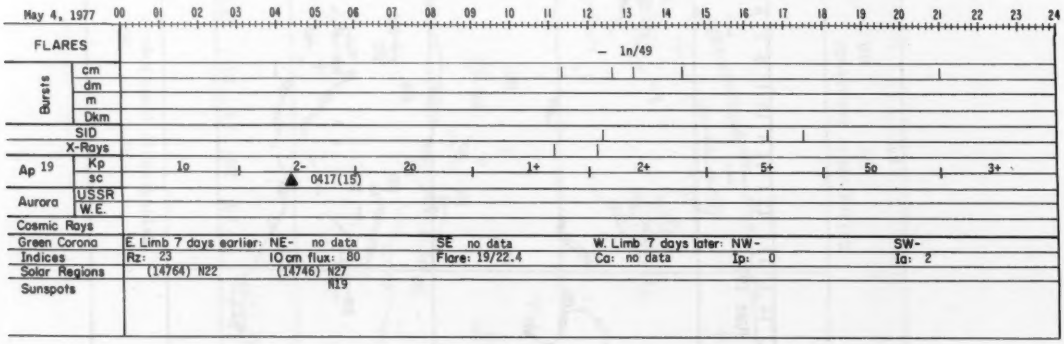
ABBREVIATED CALENDAR RECORD

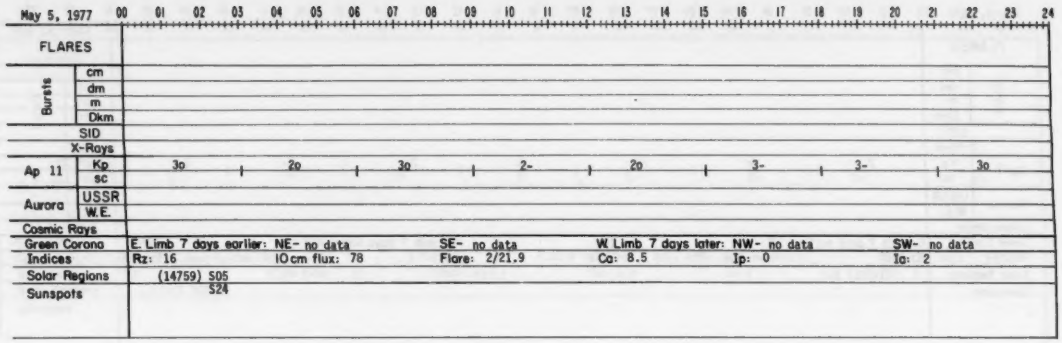
MAY 1977

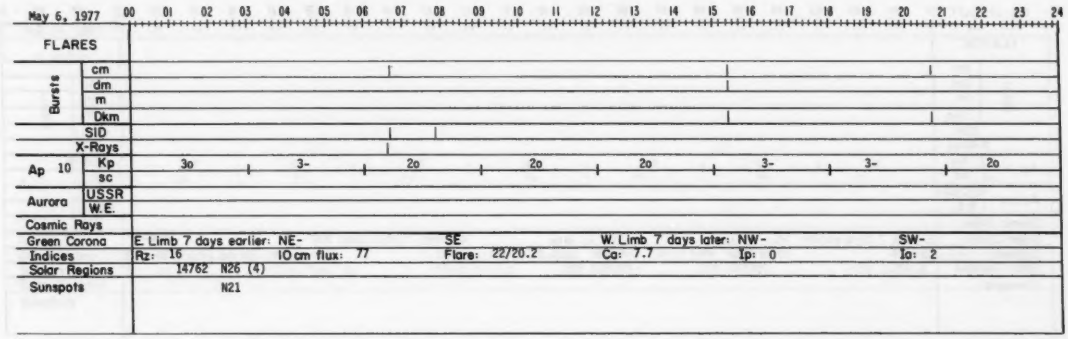


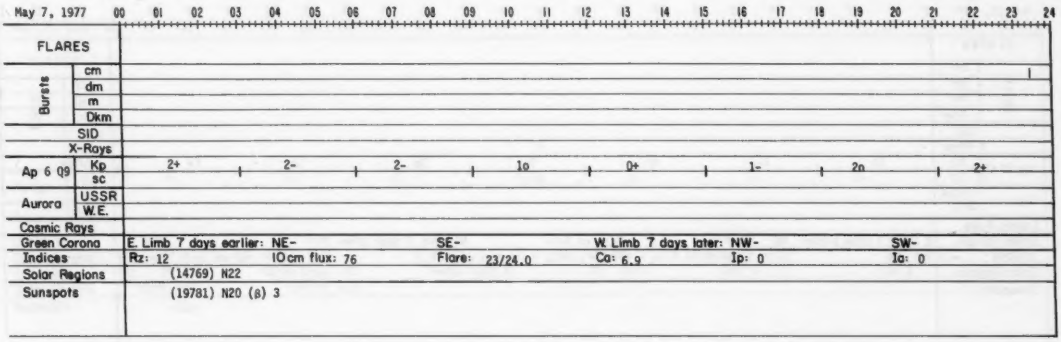


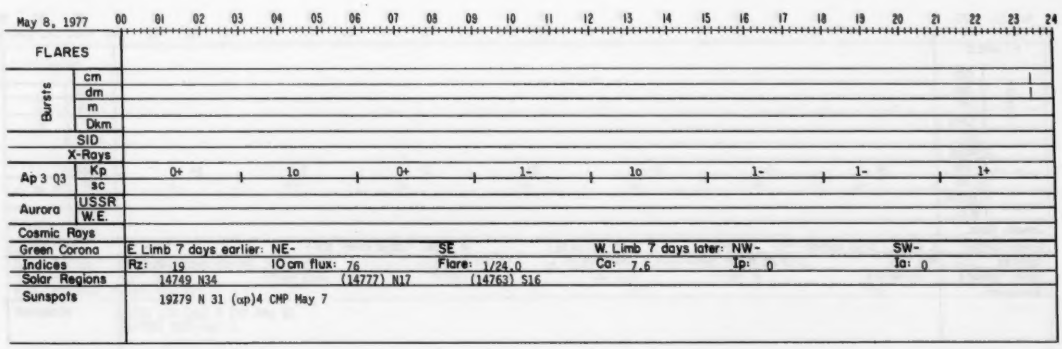





May 5, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 11
Kp
3o 2o 3o 2- 2o 3- 3- 3o
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 16 10cm flux: 78 Flare: 2/21.9 Ca: 8.5 Ip: 0 Ia: 2
Solar Regions
(14759) S05
Sunspots
S24


May 6, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 10
Kp
3o 3- 2o 2o 2o 3- 3- 2o
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- SW-
Indices
Rz: 16 10cm flux: 77 Flare: 22/20.2 Ca: 7.7 Ip: 0 Ia: 2
Solar Regions
14762 N26 (4)
Sunspots
N21


May 7, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 6 Q9
Kp
2+ 2- 2- 1o 0+ 1- 2o 2+
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- SW-
Indices
Rz: 12 10cm flux: 76 Flare: 23/24.0 Ca: 6.9 Ip: 0 Ia: 0
Solar Regions
(14769) N22
Sunspots
(19781) N20 (a) 3


May 8, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 3 Q3
Kp
0+ 1o 0+ 1- 1o 1- 1- 1+
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- SW-
Indices
Rz: 19 10cm flux: 76 Flare: 1/24.0 Ca: 7.6 Ip: 0 Ia: 0
Solar Regions
14749 N34 (14777) N17 (14763) S16
Sunspots
19779 N 31 (αp)4 CMP May 7

May 9, 1977 — 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 7	Kp	2- | 2o | 1+ | 2o | 2o | 3- | 2- | 1+
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- SW-
Indices		Rz: 25 10cm flux: 82 Flare: 4/18.9 Ca: 7.9 Ip: 0 Ia: 1
Solar Regions		(14765) N14
Sunspots		

May 10, 1977 — 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

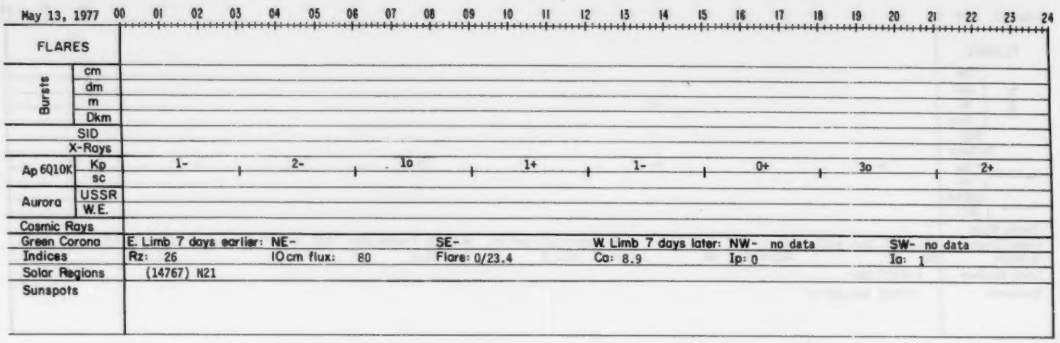
FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 9	Kp	1o | 2- | 4- | 2o | 2o | 2+ | 2- | 2+
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- SW-
Indices		Rz: 29 10cm flux: 79 Flare: 0/24.0 Ca: 7.7 Ip: 0 Ia: 1
Solar Regions		(14772) S17 (14770) N15 (14766) N29
Sunspots		

May 11, 1977 — 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 24 D2	Kp	2o | 2- | 4o | 3o | 3o | 5o | 5+ | 3o
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- SW-
Indices		Rz: 34 10cm flux: 79 Flare: 5/24.0 Ca: 9.2 Ip: 0 Ia: 3
Solar Regions		
Sunspots		

May 12, 1977 — 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

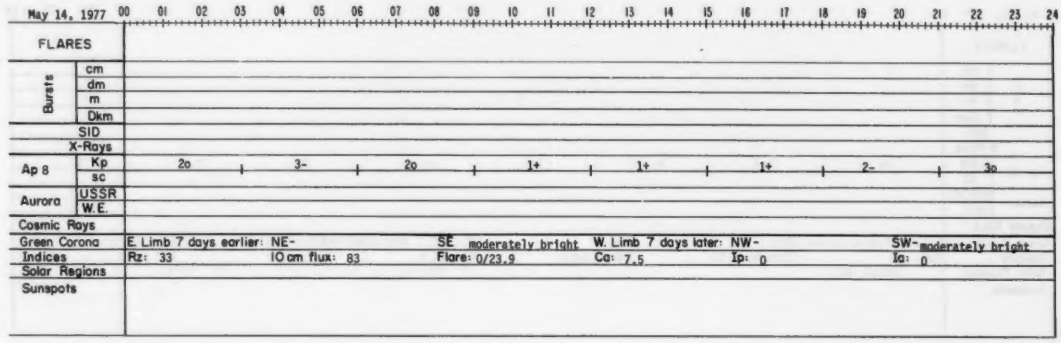
FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 19 25	Kp	3o | 6- | 4o | 3o | 3- | 2- | 1+ | 1-
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- SW-
Indices		Rz: 35 10cm flux: 78 Flare: 6/21.8 Ca: 8.2 Ip: 0 Ia: 3
Solar Regions		14768 S24
Sunspots		S23



May 13, 1977

		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
FLARES																										
Bursts	cm																									
	dm																									
	m																									
	Dkm																									
SID																										
X-Rays																										
Ap 6Q10K	Kp	1-				2-				1o				1+				1-				0+				3o				2+
	sc																									
Aurora	USSR																									
	W.E.																									
Cosmic Rays																										

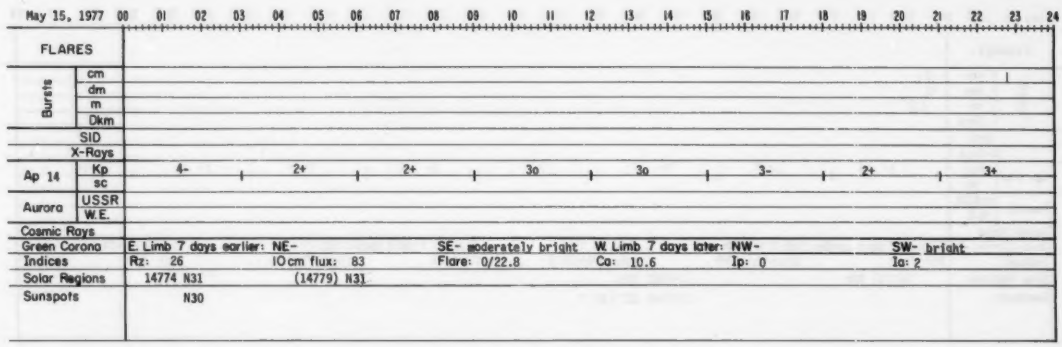
Green Corona	E. Limb 7 days earlier: NE-		SE-	W. Limb 7 days later: NW- no data	SW- no data
Indices	Rz: 26	10cm flux: 80	Flare: 0/23.4	Ca: 8.9	Ip: 0	Ia: 1
Solar Regions	(14767) N21				
Sunspots					



May 14, 1977

		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
FLARES																										
Bursts	cm																									
	dm																									
	m																									
	Dkm																									
SID																										
X-Rays																										
Ap 8	Kp	2o				3-				2o				1+				1+				1+				2-				3o
	sc																									
Aurora	USSR																									
	W.E.																									
Cosmic Rays																										

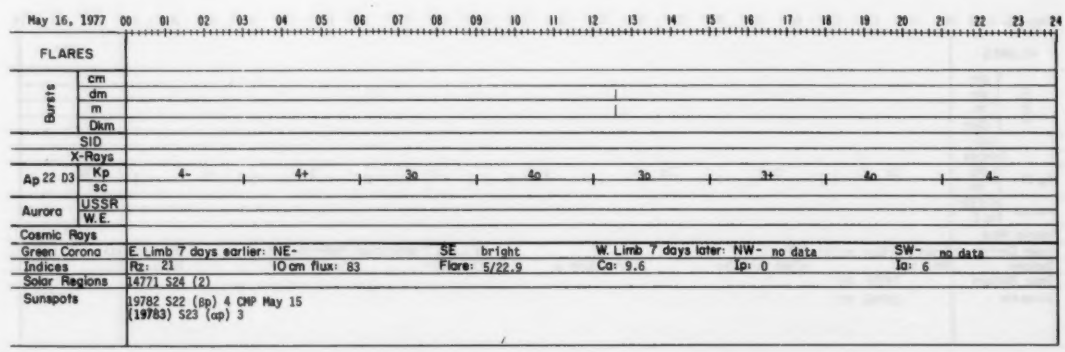
Green Corona	E. Limb 7 days earlier: NE-		SE moderately bright	W. Limb 7 days later: NW-	SW- moderately bright
Indices	Rz: 33	10cm flux: 83	Flare: 0/23.9	Ca: 7.5	Ip: 0	Ia: 0
Solar Regions					
Sunspots					



May 15, 1977

		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
FLARES																										
Bursts	cm																									
	dm																									
	m																									
	Dkm																									
SID																										
X-Rays																										
Ap 14	Kp	4-				2+				2+				3o				3o				3-				2+				3+
	sc																									
Aurora	USSR																									
	W.E.																									
Cosmic Rays																										

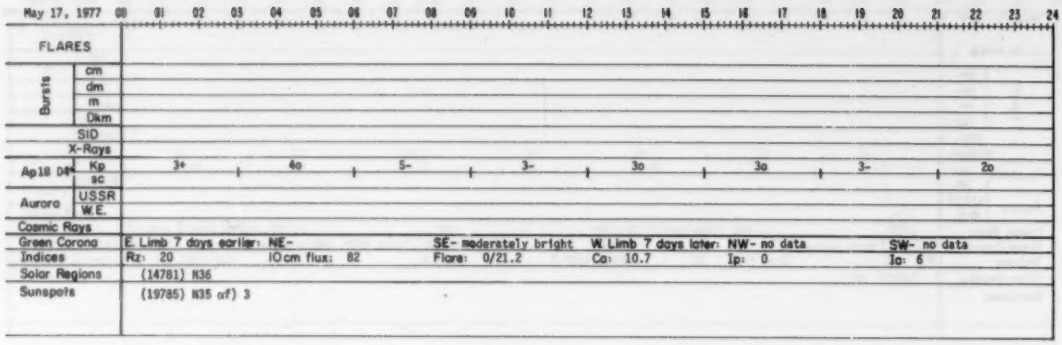
Green Corona	E. Limb 7 days earlier: NE-		SE- moderately bright	W. Limb 7 days later: NW-	SW- bright
Indices	Rz: 26	10cm flux: 83	Flare: 0/22.8	Ca: 10.6	Ip: 0	Ia: 2
Solar Regions	14774 N31	(14779) N31			
Sunspots	N30				

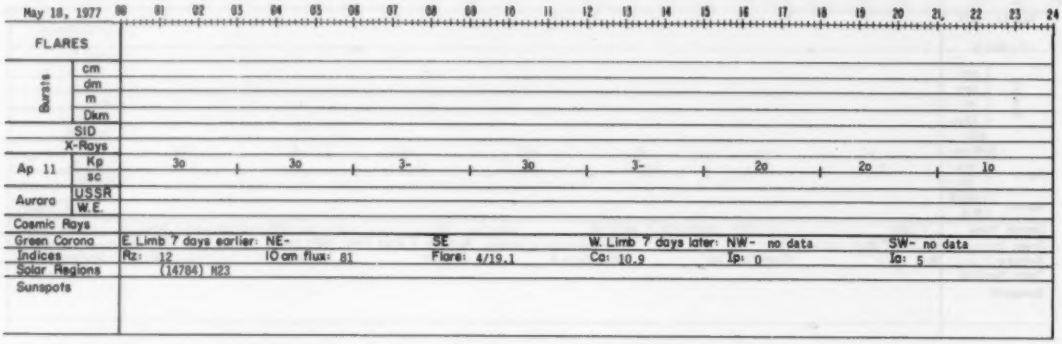


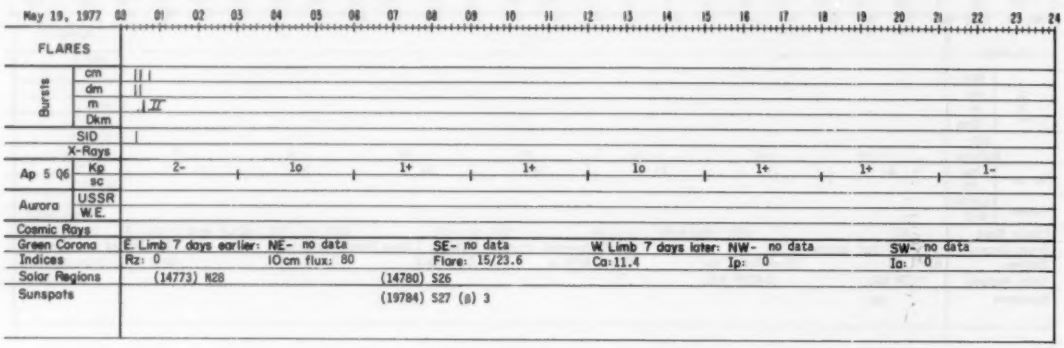
May 16, 1977

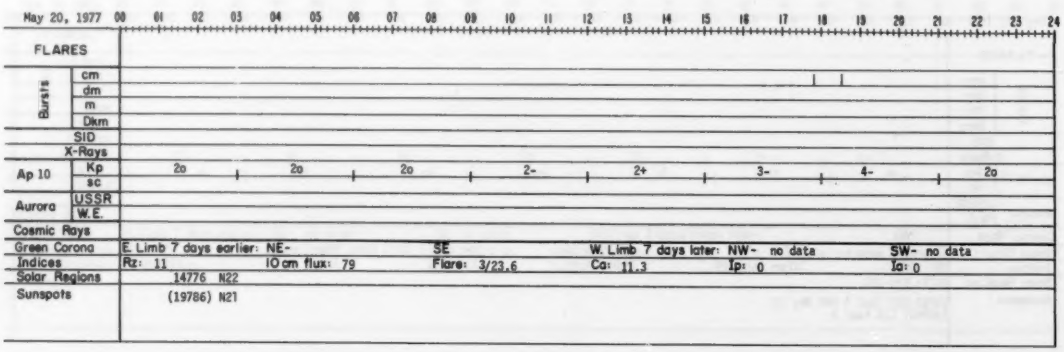
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
FLARES																										
Bursts	cm																									
	dm																									
	m																									
	Dkm																									
SID																										
X-Rays																										
Ap 22 D3	Kp	4-				4+				3o				4o				3o				3+				4o				4-
	sc																									
Aurora	USSR																									
	W.E.																									
Cosmic Rays																										

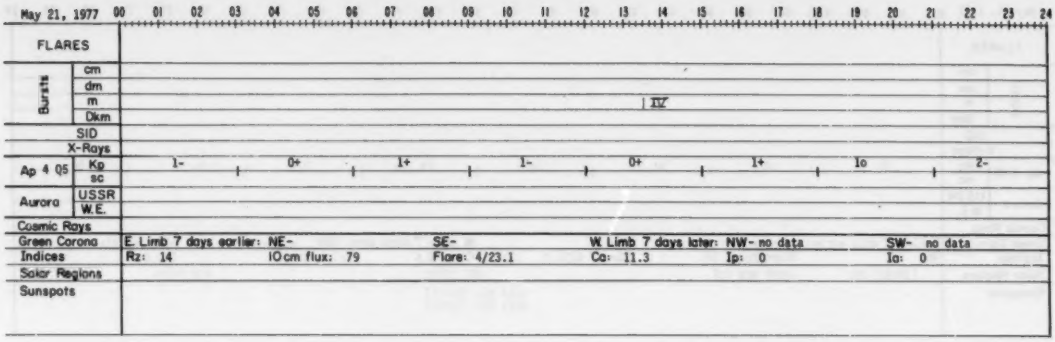
Green Corona	E. Limb 7 days earlier: NE-		SE bright	W. Limb 7 days later: NW- no data	SW- no data
Indices	Rz: 21	10cm flux: 83	Flare: 5/22.9	Ca: 9.6	Ip: 0	Ia: 6
Solar Regions	14771 S24 (2)				
Sunspots	19782 S22 (βp) 4 CMP May 15 (19783) S23 (αp) 3				

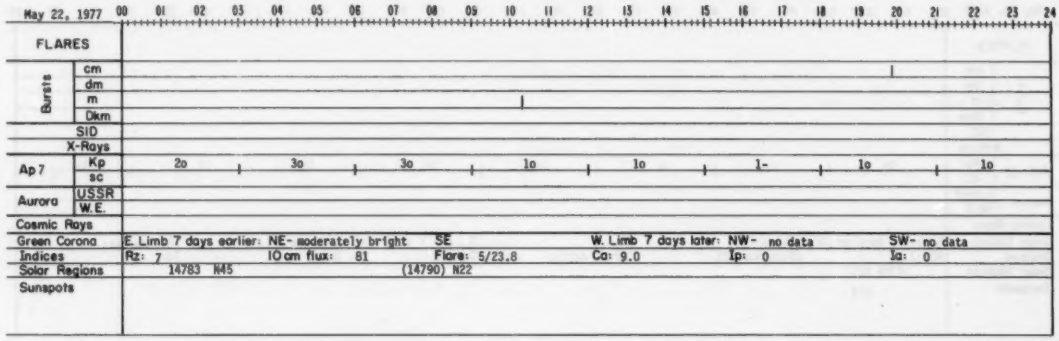

May 17, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 18 04
Kp
sc
3+ 4o 5- 3- 3o 3o 3- 2o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE-
SE- moderately bright
W. Limb 7 days later: NW- no data
SW- no data
Indices
Rz: 20
10cm flux: 82
Flare: 0/21.2
Ca: 10.7
Ip: 0
Ia: 6
Solar Regions
(14781) N36
Sunspots
(19785) N35 αf) 3

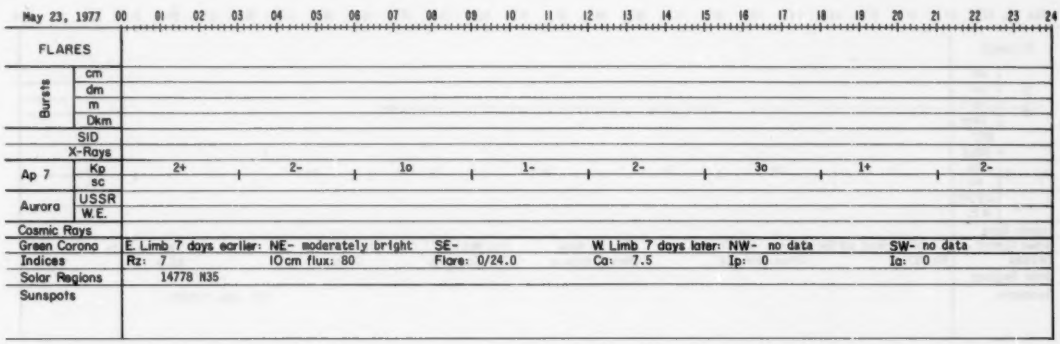

May 18, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 11
Kp
sc
3o 3o 3- 3o 3- 2o 2o 1o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE-
SE
W. Limb 7 days later: NW- no data
SW- no data
Indices
Rz: 12
10cm flux: 81
Flare: 4/19.1
Ca: 10.9
Ip: 0
Ia: 5
Solar Regions
(14784) N23
Sunspots

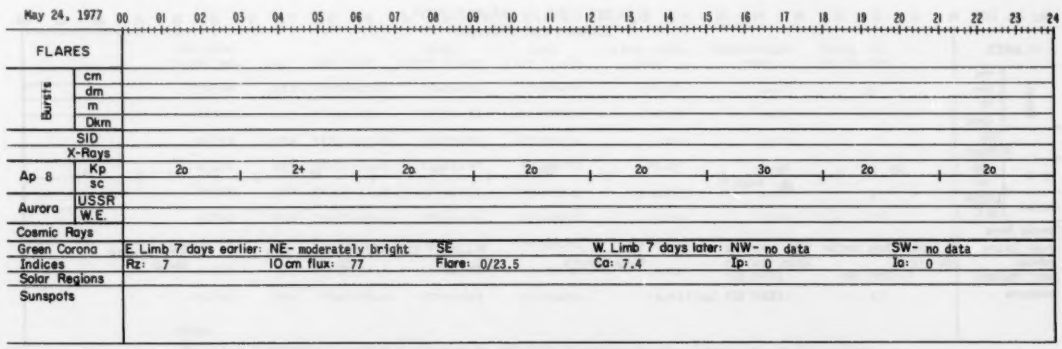

May 19, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 5 06
Kp
sc
2- 1o 1+ 1+ 1o 1+ 1+ 1-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data
SE- no data
W. Limb 7 days later: NW- no data
SW- no data
Indices
Rz: 0
10cm flux: 80
Flare: 15/23.6
Ca: 11.4
Ip: 0
Ia: 0
Solar Regions
(14773) N28
(14780) S26
Sunspots
(19784) S27 (β) 3


May 20, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 10
Kp
sc
2o 2o 2o 2- 2+ 3- 4- 2o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE-
SE
W. Limb 7 days later: NW- no data
SW- no data
Indices
Rz: 11
10cm flux: 79
Flare: 3/23.6
Ca: 11.3
Ip: 0
Ia: 0
Solar Regions
14776 N22
Sunspots
(19786) N21


May 21, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 4 Q5
Kp
sc
1- 0+ 1+ 1- 0+ 1+ 1o 2-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 14 10cm flux: 79 Flare: 4/23.1 Ca: 11.3 Ip: 0 Ia: 0
Solar Regions
Sunspots


May 22, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 7
Kp
sc
2o 3o 3o 1o 1o 1- 1o 1o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 7 10cm flux: 81 Flare: 5/23.8 Ca: 9.0 Ip: 0 Ia: 0
Solar Regions
14783 N45 (14790) N22
Sunspots


May 23, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 7
Kp
sc
2+ 2- 1o 1- 2- 3o 1+ 2-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE- W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 7 10cm flux: 80 Flare: 0/24.0 Ca: 7.5 Ip: 0 Ia: 0
Solar Regions
14778 N35
Sunspots


May 24, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 8
Kp
sc
2o 2+ 2o 2o 2o 3o 2o 2o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SE W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 7 10cm flux: 77 Flare: 0/23.5 Ca: 7.4 Ip: 0 Ia: 0
Solar Regions
Sunspots

May 25, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 5 Q8	Kp	2+ 1o 1+ 1o 1+ 2- 1+ 1o
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- moderately bright SE- W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 0 10cm flux: 75 Flare: 0/22.0 Ca: 6.5 Ip: 0 Ia: 0
Solar Regions		(14782) S33 14787 N25 (3)
Sunspots		

May 26, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

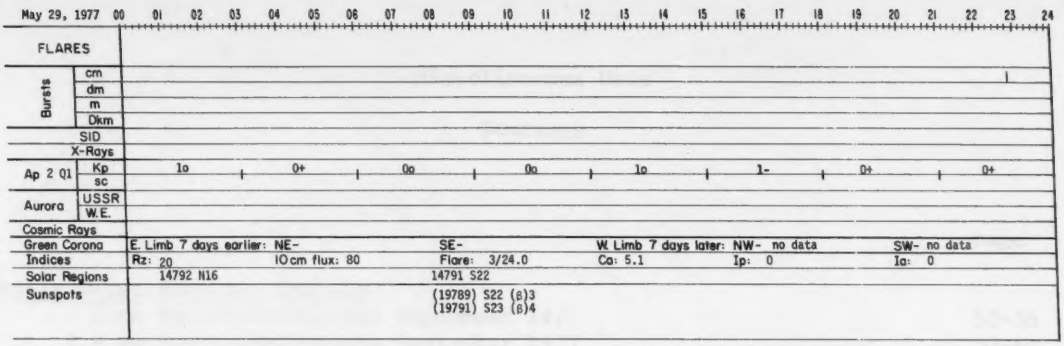
FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 2 Q2	Kp	0+ 1- 0o 0o 0+ 1o 1+ 1o
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- bright SE W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 7 10cm flux: 75 Flare: 0/23.0 Ca: 5.3 Ip: 0 Ia: 0
Solar Regions		14786 S25
Sunspots		S23

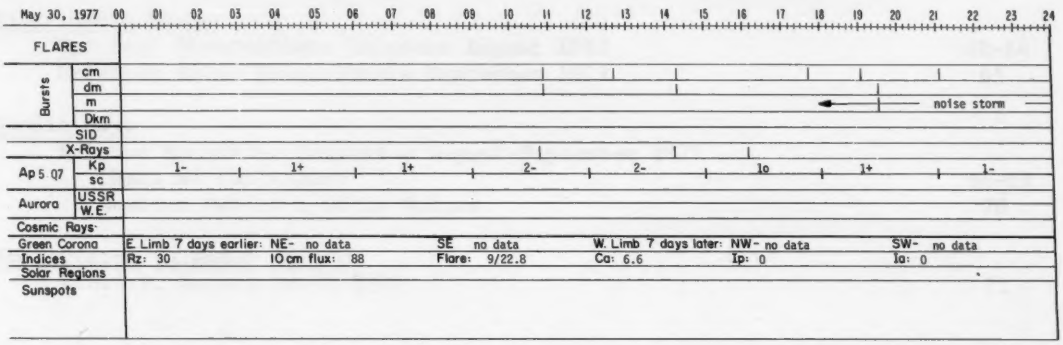
May 27, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

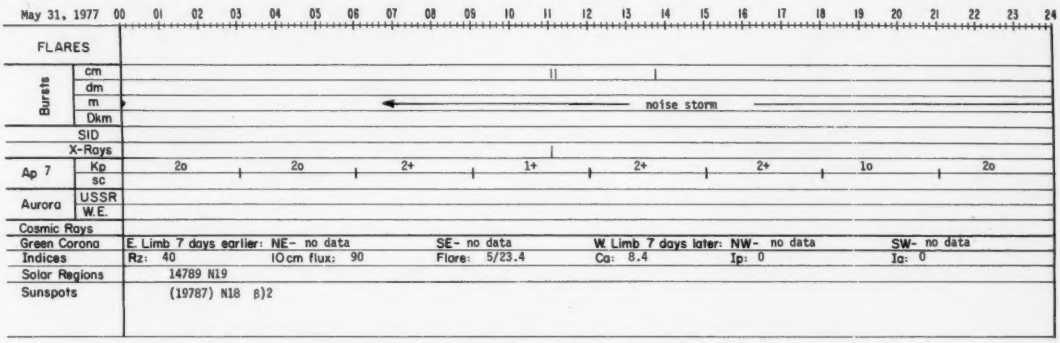
FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 4 Q4	Kp	1- 1o 2- 0+ 1o 1o 1- 0+
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 13 10cm flux: 76 Flare: 0/24.0 Ca: 5.8 Ip: 0 Ia: 0
Solar Regions		
Sunspots		

May 28, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 7	Kp	1o 2o 1- 3o 2+ 1o 3- 1o
	sc	▲ 0424(7)
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- moderately bright SE W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 16 10cm flux: 77 Flare: 11/22.8 Ca. 5.5 Ip: 0 Ia: 0
Solar Regions		(14788) N08 14785 N22
Sunspots		19788 N21 (ap)3







REGIONAL FLARE INDEX

INCLUDES ALL FLARES

MC MATH PLAGE NO.	LAT	CMP DATE	DATE FIRST FLARE	DATE LAST FLARE	FLARE-INDEX SUM	FLARE-INDEX MEAN	TOTAL NO. OF FLARES
14742	S23	77/05/02.5	77/04/26	77/05/01	10.71	1.78	4
14749	N34	77/05/08.0	77/04/30	77/05/09	79.63	7.96	29
14768	S24	77/05/12.5	77/05/08	77/05/11	6.88	1.72	3
14771	S24	77/05/16.6	77/05/09	77/05/19	38.77	2.88	9
14781	N37	77/05/17.2	77/05/21	77/05/22	2.55	1.27	3
14780	S28	77/05/19.6	77/05/20	77/05/20	3.39	3.39	1
14776	N22	77/05/20.8	77/05/21	77/05/22	6.86	3.43	2
14785	N22	77/05/28.9	77/05/30	77/06/04	14.52	2.42	14
14791	S22	77/05/29.5	77/05/28	77/06/04	13.59	1.70	5

Note:
Because of differences in method of calculation, the dates of Central Meridian Passage for the McMath Plage Regions vary somewhat from those given elsewhere. Any region not listed here produced no flares during its disk passage.

Miscellaneous Data

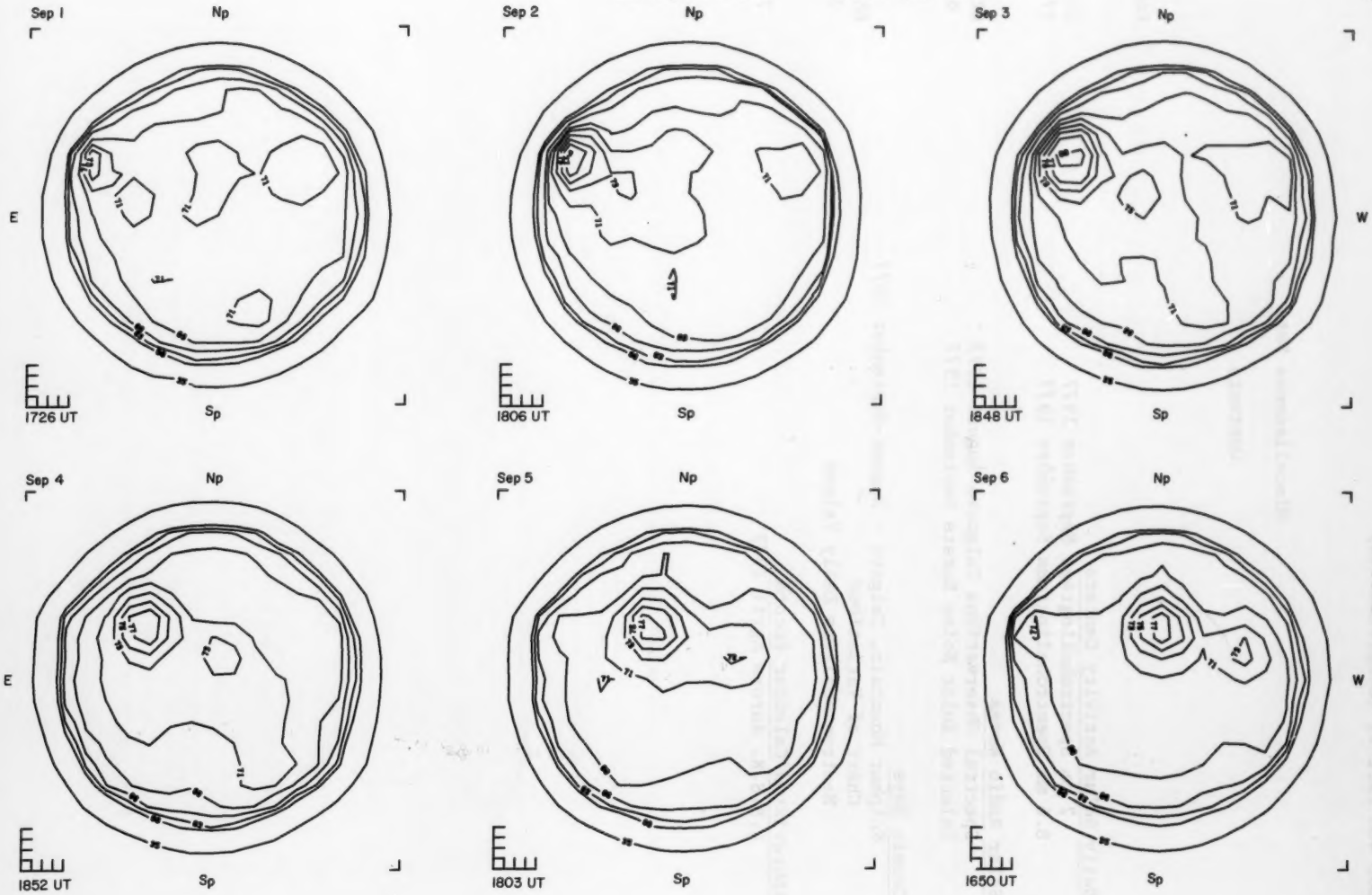
Contents

	Page
Daily Solar Activity Centers	
2 cm Spectroheliograms September 1977	52-56
8.6 mm Spectroheliograms September 1977	57-61
Solar Radio Waves	
Spectral Observations Culgoora August 1977	62-64
Selected Solar Noise Bursts September 1977	65
Cosmic Rays	
Sulphur Mountain, Calgary - August-September 1977	
Chart of Variations	66-69
Neutron Monitors Daily Values	70
Abbreviated Calendar Record	
U.S.S.R. Aurora April 1977	71

NOSC LA POSTA

2.0 CM Spectroheliograms
Ant Temp Unit 100°K

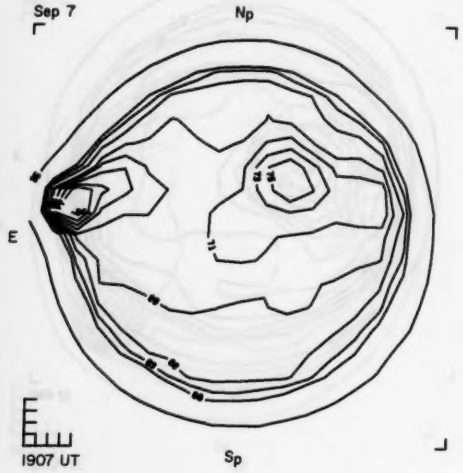
SEPTEMBER 1977

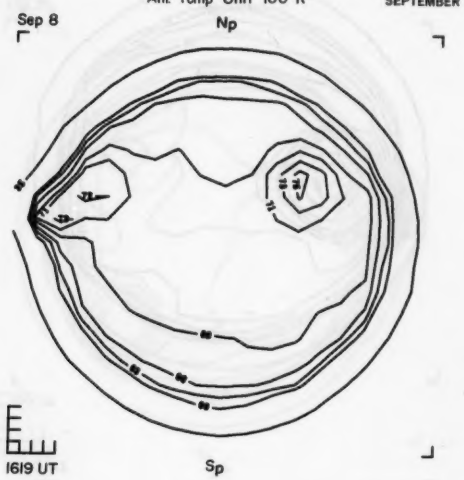


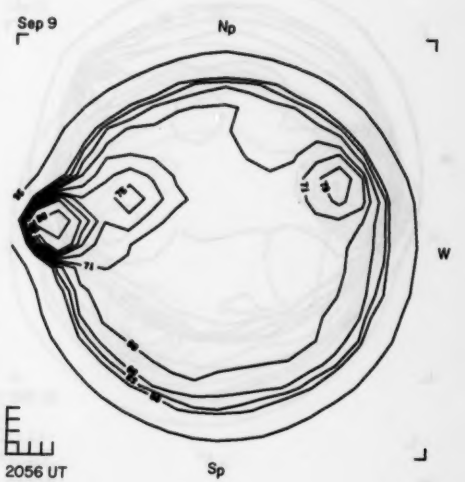
NOSC LA POSTA

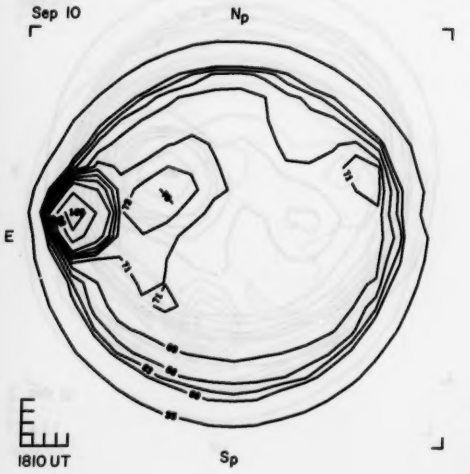
2.0 CM Spectroheliograms
Ant Temp Unit 100°K

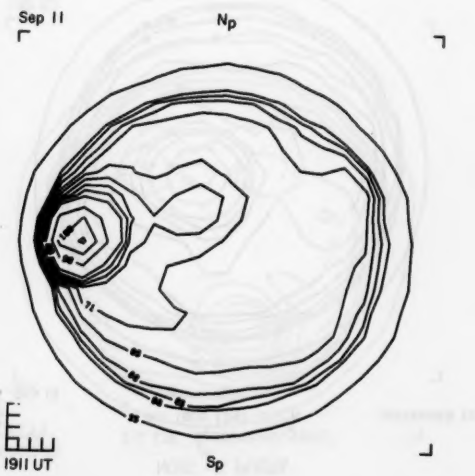
SEPTEMBER 1977









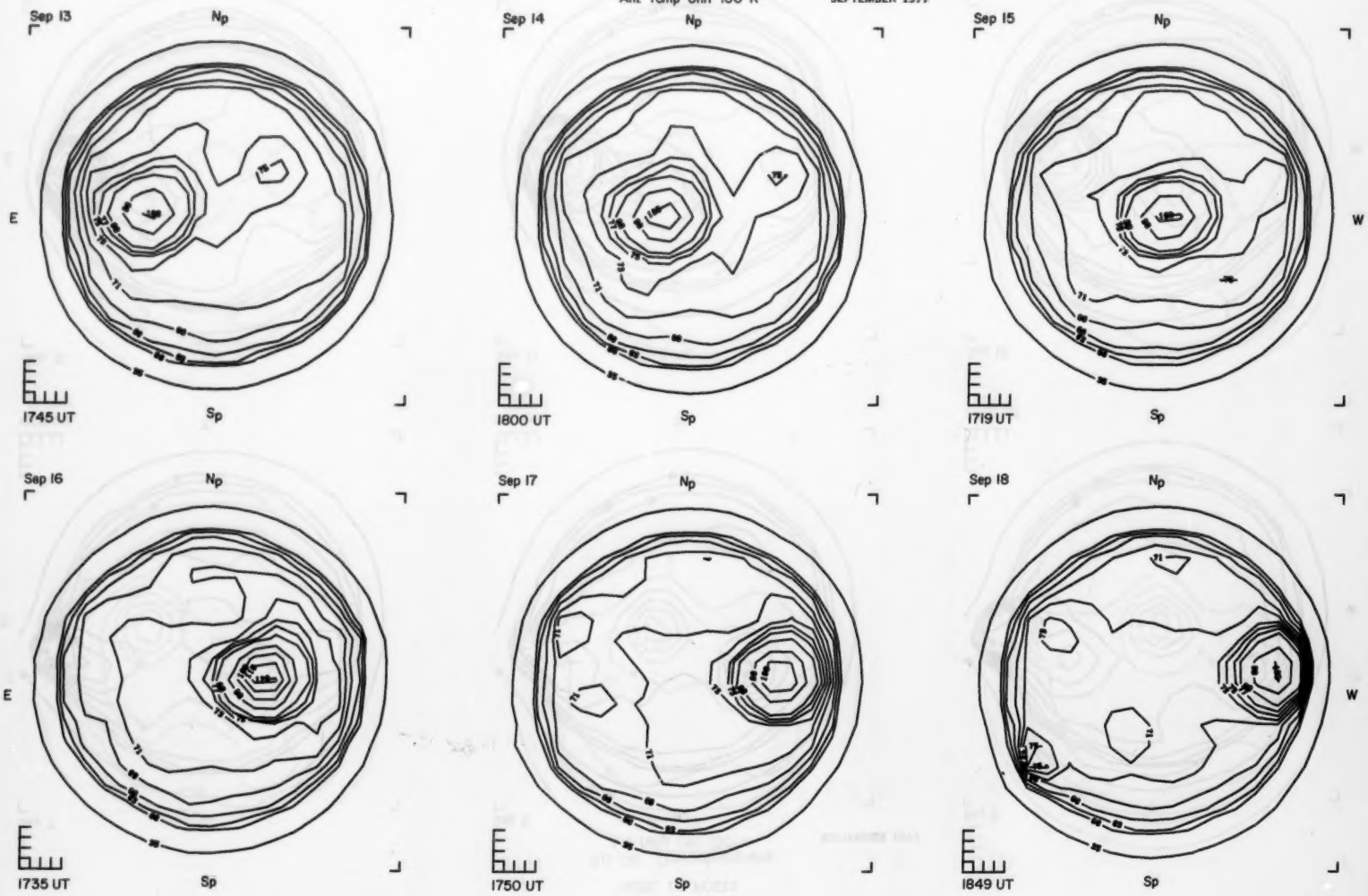


53
Misc
Sep 77

NOSC LA POSTA

2.0 CM Spectroheliograms
Ant Temp Unit 100°K

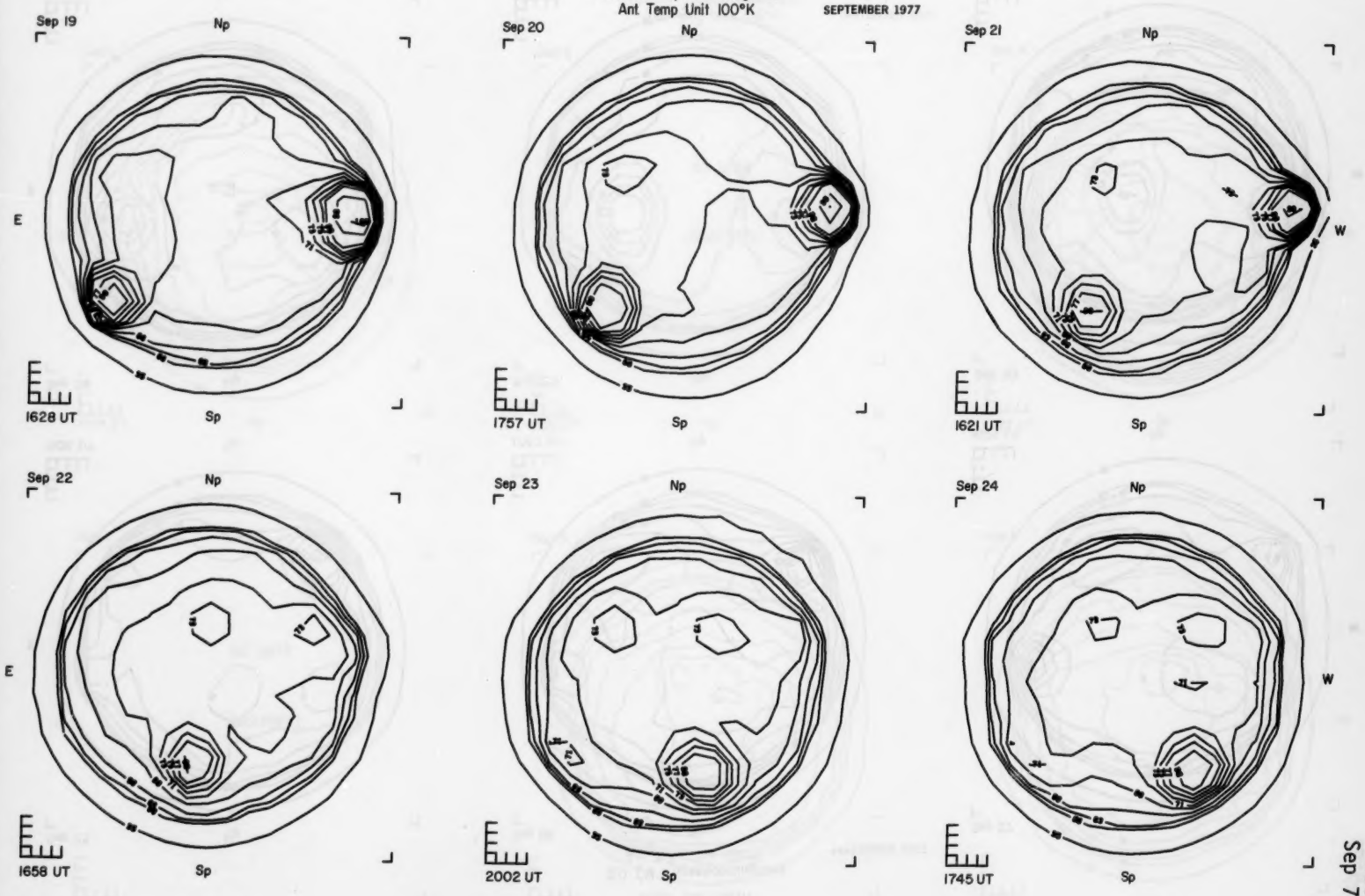
SEPTEMBER 1977



NOSC LA POSTA

2.0 CM Spectroheliograms
Ant Temp Unit 100°K

SEPTEMBER 1977

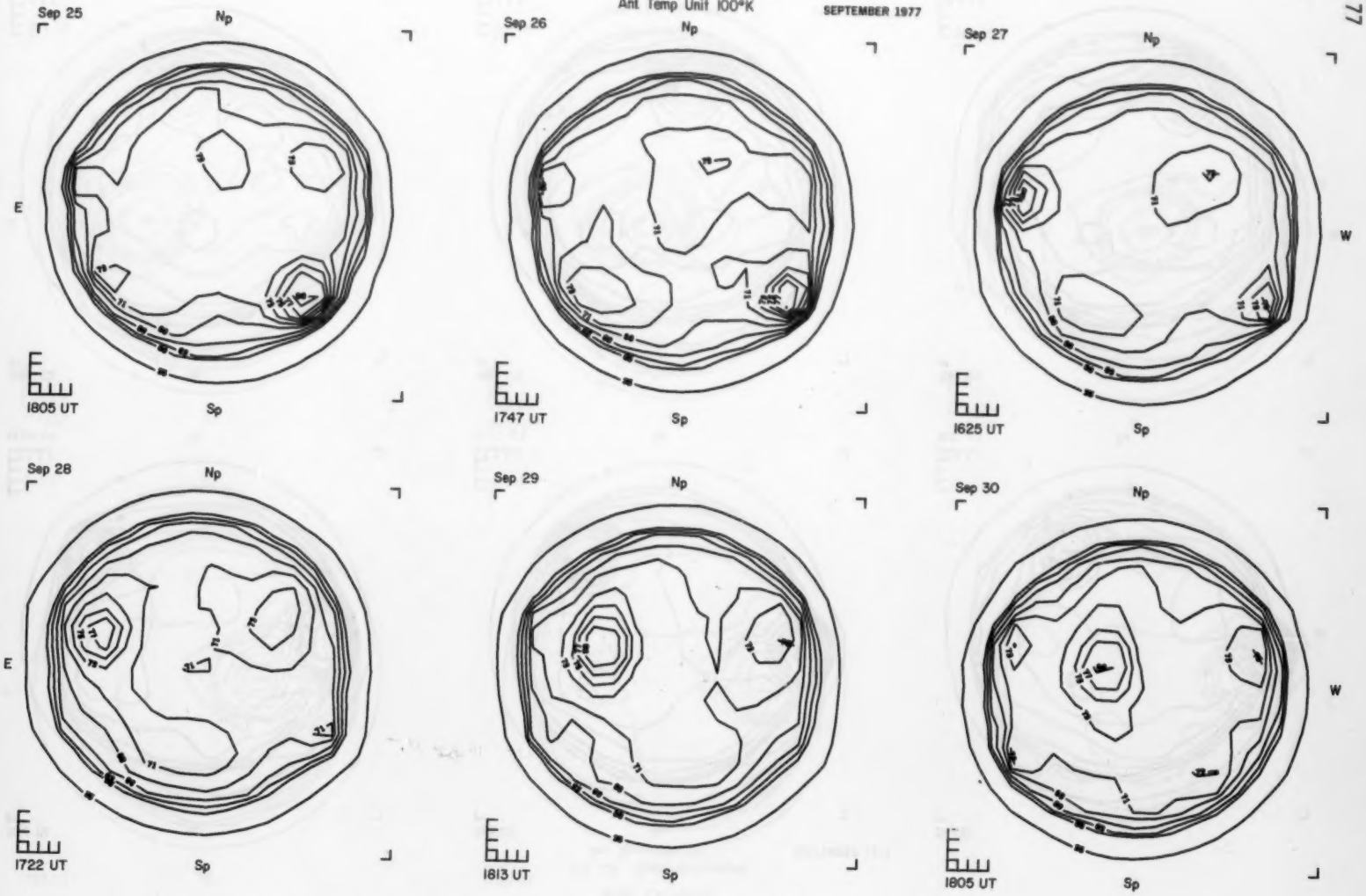


55
Misc
Sep 77

NOSC LA POSTA

2.0 CM Spectroheliograms
Ant Temp Unit 100°K

SEPTEMBER 1977

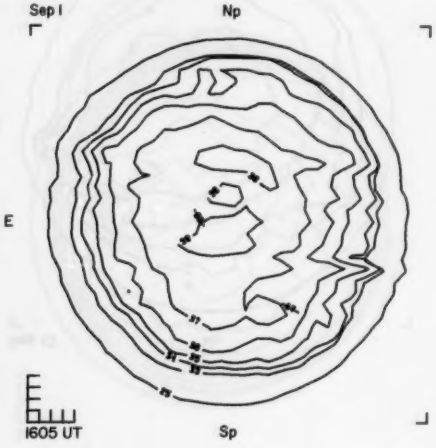


NOSC LA POSTA

8.6 MM Spectroheliograms
Ant Temp Unit 100°K

SEPTEMBER 1977

Sep 1



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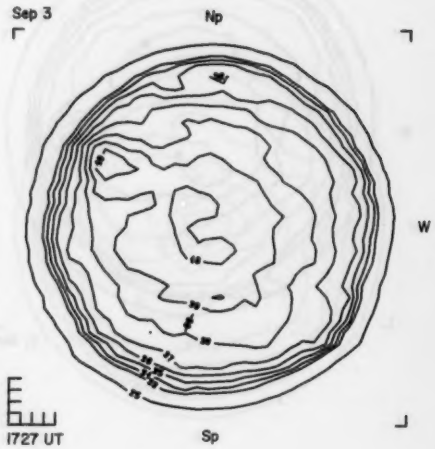
Sep 3



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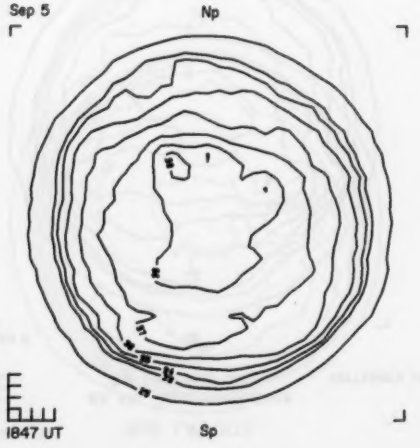
Sep 5



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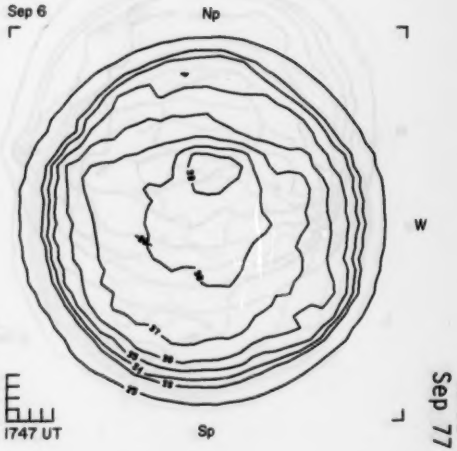


57
Misc
Sep 77

NOSC LA POSTA

8.6 MM Spectroheliograms
Ant Temp Unit 100°K

SEPTEMBER 1977

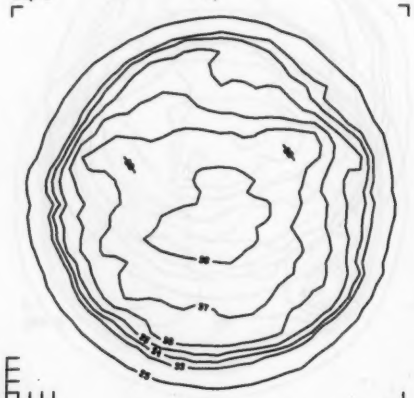
Sep 7 Np

NO DATA

E CLOUDY

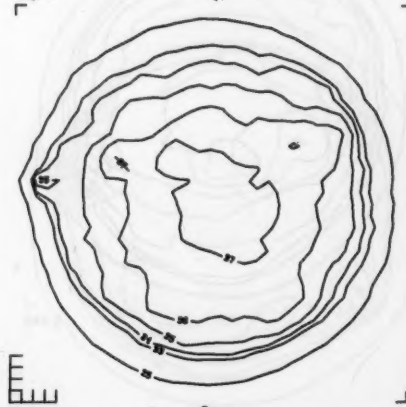
1944 UT Sp

Sep 8 Np



1716 UT Sp

Sep 9 Np



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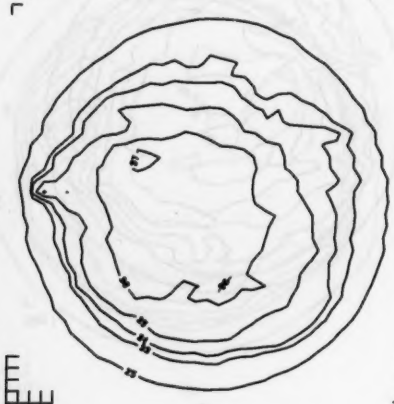
Sep 10 Np



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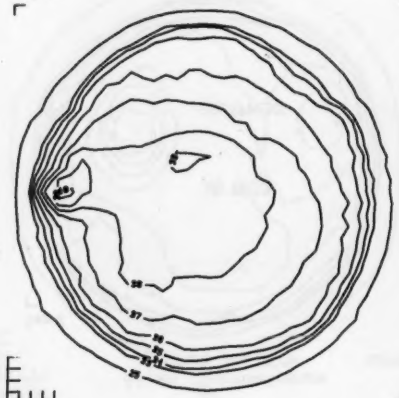

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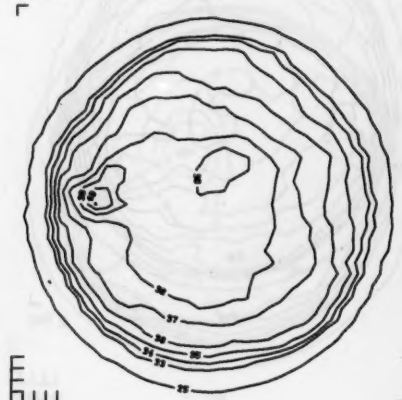
Sep 12 Np



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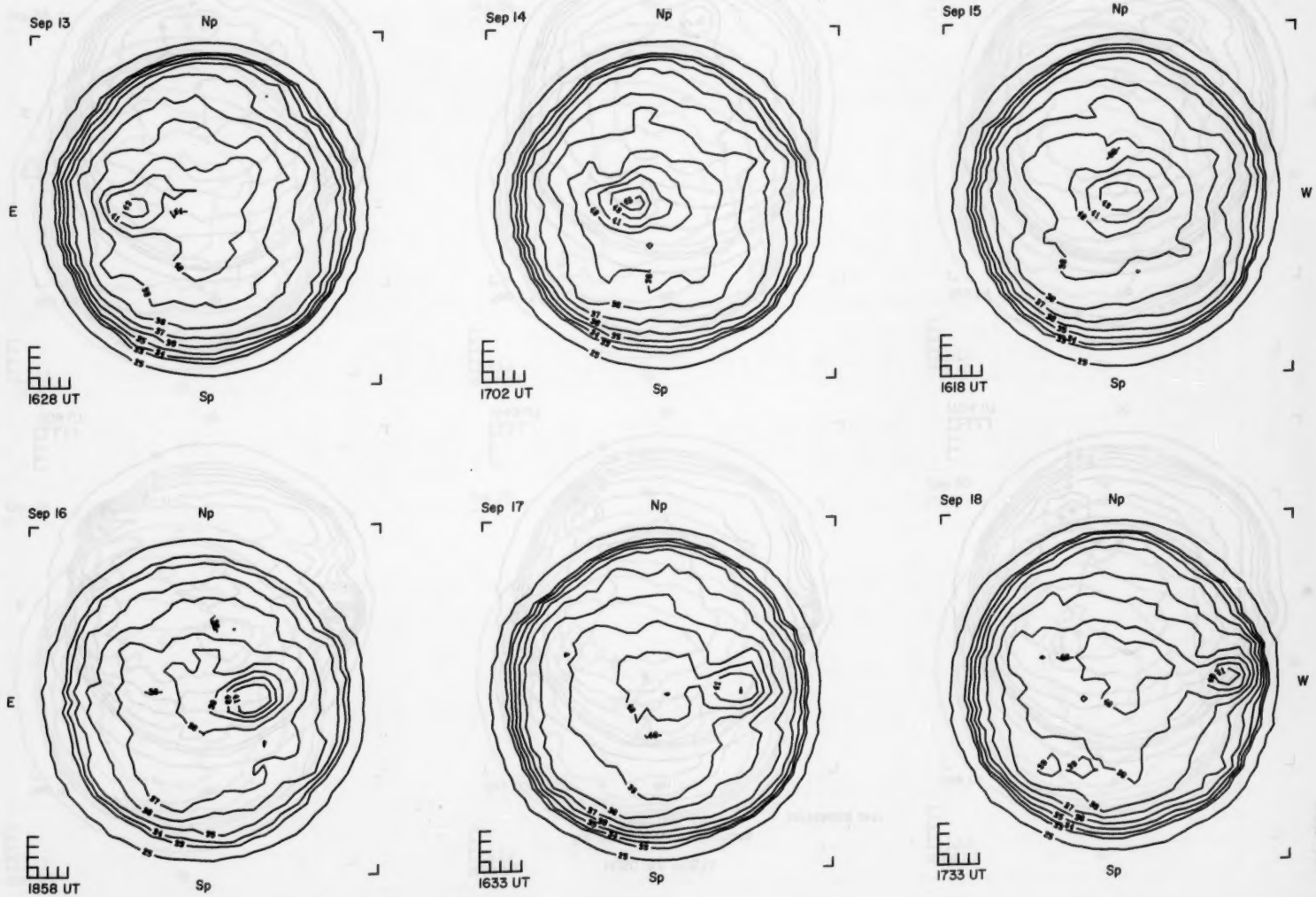
1626 UT Sp

NOSC LA POSTA

8.6 MM Spectroheliograms
Ant Temp Unit 100°K SEPTEMBER 1977

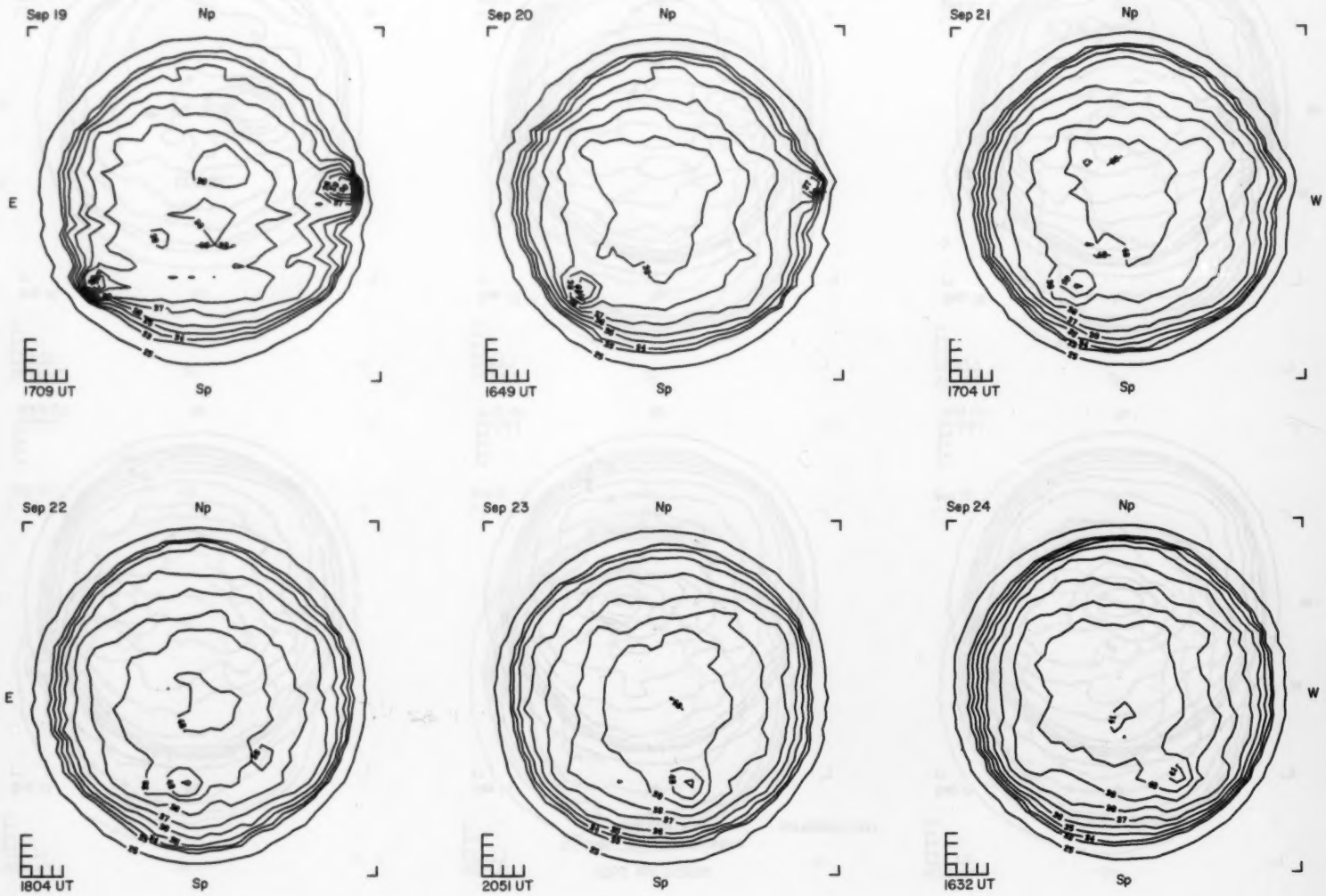


59
Misc
Sep 77

NOSC LA POSTA

8.6 MM Spectroheliograms
Ant Temp Unit 100°K

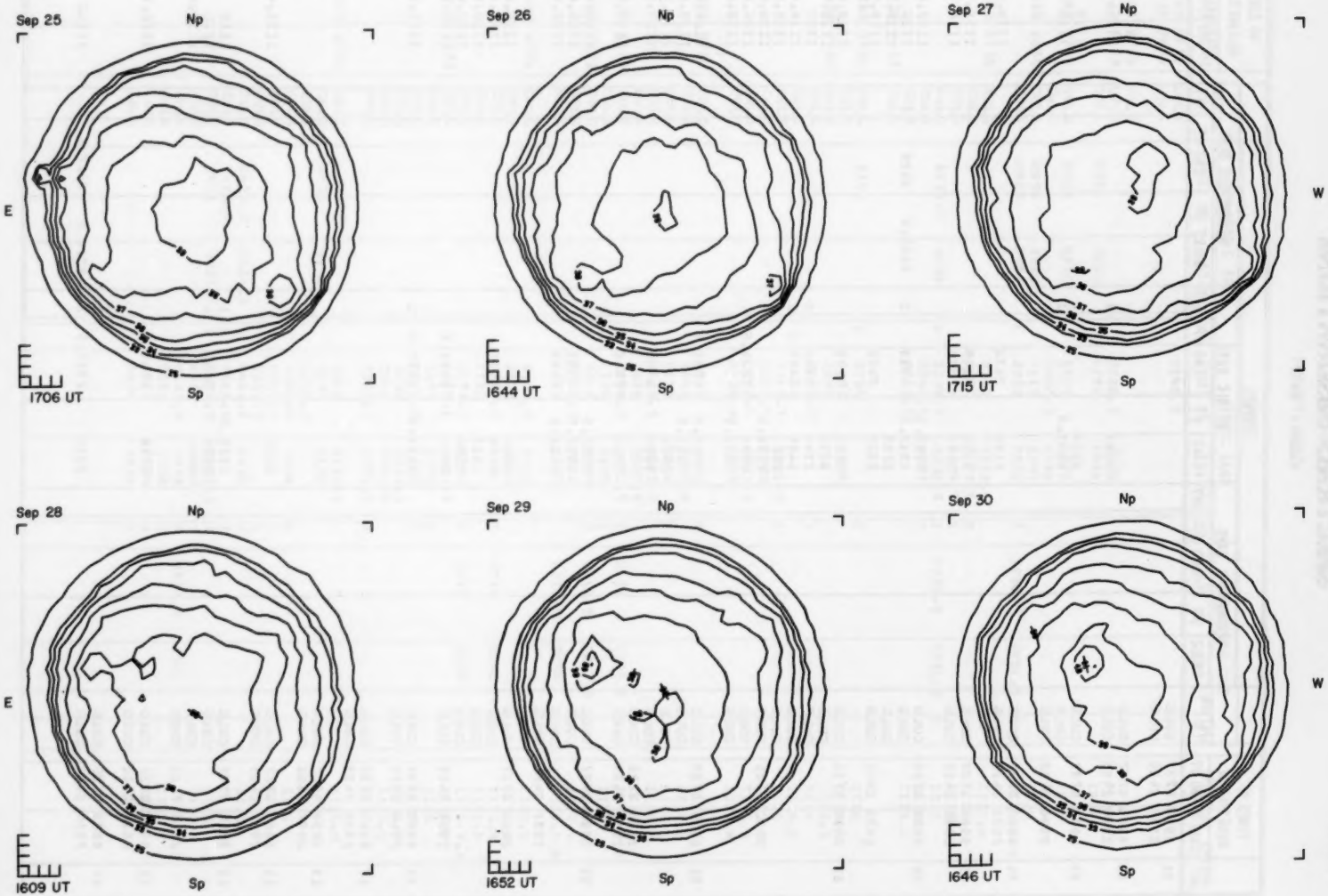
SEPTEMBER 1977



NOSC LA POSTA

8.6 MM Spectroheliograms
Ant Temp Unit 100°K

SEPTEMBER 1977



SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

AUGUST 1977

AUG 1977	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
01	0000	0737	CULG										
	2039	2400	CULG										
02	0000	0737	CULG										
	2039	2400	CULG				2255		1				IIIB,U
03	0000	0737	CULG				0037		1				IIIB
			CULG				0632.5		1				IIIB
	2034	2400	CULG										
04	0000	0738	CULG										
	2038	2400	CULG				2128	2400					IIIN,W
05	0000	0738	CULG				0000	0105					IIIN,W
	2038	2400	CULG				2107	2300					IIIN,W
06	0000	0738	CULG				0005.5						IIIB,W
			CULG				0017.5	0018	1	0017.5	0018	1	IIIG
			CULG				0236						IIIB,W
	2038	2400	CULG				2322	2400					IIIN,W
07	0000	0738	CULG				0000	0120					IIIN,W
			CULG				0332						IIIB,W
			CULG				0340	0341	1				IIIG
			CULG				0404	0406.5	1				IIIG,U
			CULG				0553						IIIB,W
	2038	2400	CULG				2158.5						IIIB,W
			CULG				2201	2204.5					IIIG,W
			CULG				2310.5						IIIB,W
08	0000	0733	CULG				0010.5	0011.5					IIIG,W
			CULG				0110.5						IIIB,W
			CULG				0521						IIIB,W
			CULG				0559	0733					IIIN,W
	2038	2200	CULG										
	2218	2400	CULG				2218	2340					IIIN,W
09	0000	0737	CULG				0237.5						IIIB,W
			CULG				0302.5	0303					IIIG,W
			CULG				0452.5	0453					IIIG,W
	2038	2400	CULG										
10	0000	0737	CULG				0004						IIIB,W
			CULG				0456	0457					IIIG,W
			CULG				0501						IIIB,W
			CULG				0536						IIIB,W
	2038	2400	CULG				2221	2221.5					IIIG,W
11	0000	0737	CULG				0651.5	0652.5	1				IIIG,U
	2038	2225	CULG										
12	0044	0737	CULG										
	2038	2400	CULG										
13	0000	0737	CULG										
	2037	2400	CULG										
14	0000	0737	CULG				0401						IIIB,W
	2037	2400	CULG										
15	0000	0737	CULG				0021.5		1				IIIB
			CULG				0205	0206	1				IIIG
			CULG				0342						IIIB,W,U
	2315	2400	CULG										
16	0000	0737	CULG				0540	0540.5					IIIG,W
	2037	2400	CULG										
17	0000	0736	CULG										
	2036	2400	CULG				2304	2307.5	2	2304.5	2307.5	1	IIIGG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

AUGUST 1977

AUG 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
19	0000	0736	CULG				0048.5						IIIB,W
	2036	2400	CULG										
20	0000	0735	CULG										
	2035	2400	CULG				2208.5	2209					IIIG,W
			CULG	2358	2400		2304	2400					IS,W
21	0000	0735	CULG	0000	0735		0000	0735					IS,W
			CULG				0007.5	0008					IIIG,W
	2035	2400	CULG	2035	2210		2115	2330					IS,W
			CULG	2250	2251	1	2250	2252	2	2250.5	2251.5	1	IIIG,V,U
22	0000	0735	CULG				0118	0118.5					IIIG,W
			CULG				0122	0123.5	2				IIIG
			CULG				0234	0234.5	1				IIIG
			CULG	0235.5	0236	1	0235.5	0236.5	2	0235.5	0236.5	2	IIIG
			CULG				0548.5	0550	2				IIIG
			CULG				0719.5		1				IIIB,U
	2035	2400	CULG										
23	0000	0735	CULG	0154		1	0154		2				IIIB
			CULG				0433	0434					IIIG,W
	2035	2400	CULG				2037						IIIB,W
			CULG				2155.5		1				IIIB
			CULG				2211						IIIB,W
			CULG				2215.5	2216.5	1				IIIG
			CULG				2217.5	2220					IIIG,W
			CULG				2222.5	2223.5					IIIG,W
			CULG				2335.5	2338					IIIG,W
24	0000	0734	CULG				0530	0532	1				IIIG
			CULG				0540	0540.5					IIIG,W
			CULG				0612	0614	1				IIIG
			CULG				0620.5	0622.5					IIIG,W
			CULG				0626	0627.5					IIIG,W
	2035	2132	CULG				2058.5	2101.5	1	2100	2100.5	1	IIIG,V,U
			CULG				2124	2125	1				IIIG
	2146	2400	CULG				2215	2220	2	2215.5	2217.5	1	IIIG,V
			CULG				2245.5	2246					IIIG,W
			CULG				2333	2337		2333.5	2334		IIIG,V,W
25	0000	0734	CULG				0007.5	0008					IIIG,W
			CULG				0020	0021					IIIG,W
			CULG				0023.5	0031	2	0024	0031	2	IIIG,V
			CULG				0121						IIIB,W
			CULG				0156.5	0200	2	0157	0159	1	IIIG,V,U
	2035	2400	CULG				2058.5	2101.5					IIIG,W
			CULG				2150	2154	1				IIIG
			CULG				2229.5	2230	1				IIIG
			CULG				2233	2233.5					IIIG,W
			CULG				2241	2241.5					IIIG,W
			CULG				2250.5	2251.5	1				IIIG
26	0000	0734	CULG				0112	0112.5					IIIG,W
			CULG	0131	0132		0131	0132					IIIG,W
			CULG				0231.5						IIIB,W
			CULG				0303.5	0304	1				IIIG
			CULG				0347.5		1				IIIB
			CULG				0349.5		1				IIIB
			CULG	0403.5	0404.5	1	0403.5	0405	2				IIIG
			CULG	0411.5		1	0411.5		1				IIIB,U
			CULG	0421	0421.5	1	0420.5	0421.5	1				IIIG
			CULG				0501	0502	1				IIIG
			CULG				0502.5	0505	2	0503.5	0504	1	IIIG,V,U
			CULG				0505	0506	1				IIIG
			CULG				0510	0734	1				IIIN
			CULG				0524	0526	1				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

AUGUST 1977

AUG 1977	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
26			CULG				0535	0536.5	1				IIIG
			CULG				0537	0543	2	0538.5	0540	1	IIIGG,V,U
			CULG				0541.5	0553	2				II
			CULG				0630	0631.5	3				IIIG
			CULG				2034	2330					IS,W
	2034	2400	CULG				2034	2400					IIIN,W
			CULG				2034	2035.5	1				IIIG
			CULG				2155	2202	1				IIIGG
			CULG				2210	2212	1	2211	2212	1	IIIG
			CULG				2343.5	2345	1				IIIG
			CULG				2347.5	2350	1	2348	2350	1	IIIG
27	0000	0733	CULG				0000	0408					IIIN,W
			CULG	0008	0733								IN,W
			CULG				0045	0047	2	0046	0047	1	IIIG,V
			CULG				0710	0711.5	1				IIIG
	2033	2400	CULG				2033	2100	1				IS
			CULG				2033	2342					IIIN,W
			CULG	2140	2400		2100	2400					IS,W
			CULG				2158		1				IIIB
			CULG				2214		1				IIIB
			CULG				2258.5	2259.5	1				IIIG
			CULG				2319	2319.5	1				IIIG
28	0000	0733	CULG	0000	0733		0000	0733					IS,W
			CULG	0153	0153.5	1	0152.5	0154	1				IIIG
			CULG				0156	0159	1				IIIG
			CULG				0202	0203	2				IIIG,U
			CULG				0252	0300	1				IIIGG
			CULG				0427.5		1				IIIB
	2034	2400	CULG	2335.5	2336		2335.5	2336					IIIG,W
29	0000	0323	CULG										
	0413	0733	CULG				0455	0456					IIIG,W
			CULG				0540.5	0541.5					IIIG,W
	2034	2400	CULG										
30	0000	0733	CULG				0116						IIIB,W
			CULG				0233						IIIB,W
			CULG				0236.5						IIIB,W
			CULG				0239			0239			IIIB,W
			CULG				0253						IIIB,W
	2033	2400	CULG				2037.5	2039	2				IIIG,U
			CULG	2040	2040.5	1	2040	2041.5	1				IIIG
			CULG				2137	2138					IIIG,W
			CULG				2210.5	2211.5	1				IIIG
31	0000	0732	CULG				0452.5	0458	1				IIIGG
	2032	2400	CULG				2045.5						IIIB,W
			CULG				2122						IIIB,W
			CULG				2125.5						IIIB,W
			CULG	2127	2127.5	1	2127	2128	1				IIIG
			CULG				2222.5	2223	1				IIIG
			CULG				2240.5	2241	1				IIIG,U
			CULG				2317	2317.5					IIIG,W
			CULG				2336.5	2337.5					IIIG,W

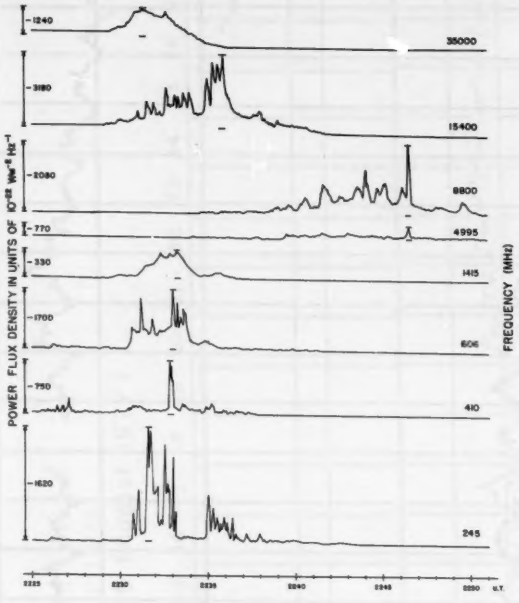
The symbols used in connection with the spectral type in describing the important bursts are as follows:

B = Single burst
G = Small group (< 10) of bursts
GG = Large group (> 10) of bursts
C = Underlying continuum (particularly with type I)
S = Storm in the sense of intermittent but apparently connected activity
N = Intermittent activity in this period
U = U-shaped burst of Type III
RS = Reverse slope burst
DP = Drifting pairs
DC = Drifting Chains
H = Herringbone
W = Weak
P = Pulsations
CONT = Continuum
UNCLF = Unclassified activity

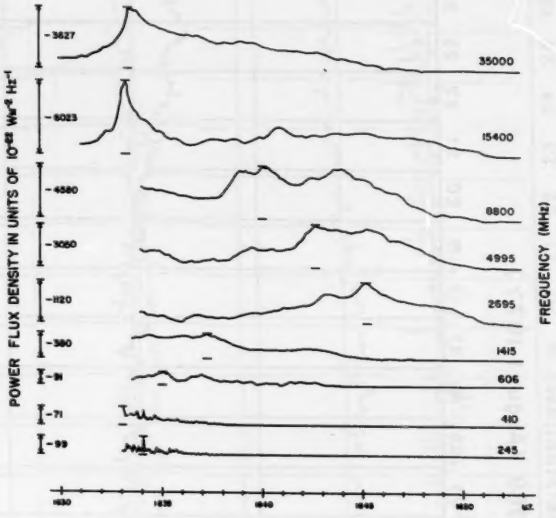
POWER FLUX DENSITY IN UNITS OF 10^{-22} Wm^{-2} Hz^{-1}

SELECTED SOLAR NOISE BURSTS

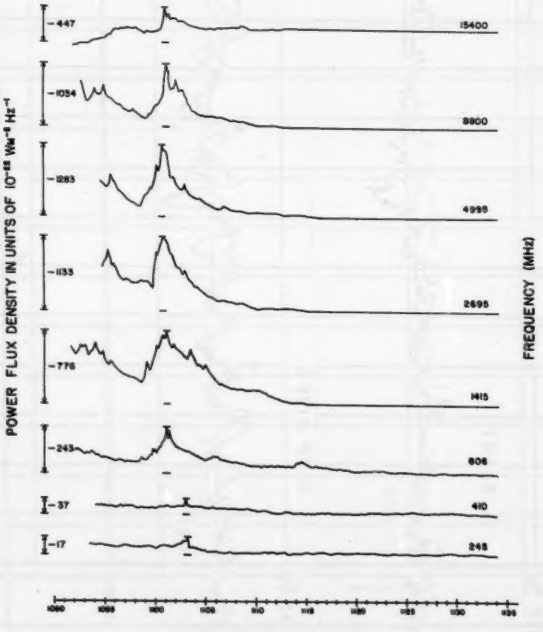
7 - 19 SEPTEMBER 1977



SEPTEMBER 7, 1977



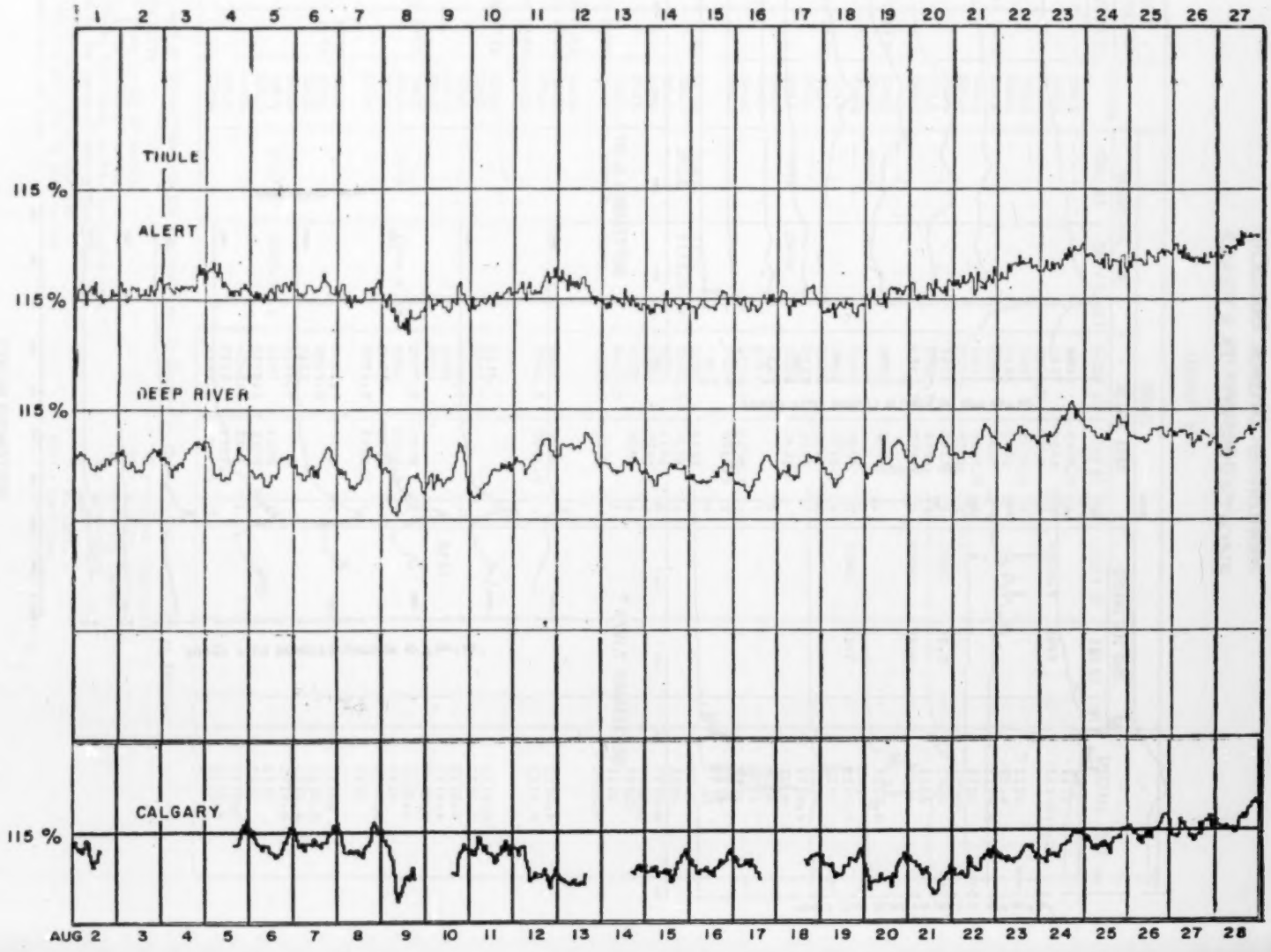
SEPTEMBER 9, 1977



SEPTEMBER 19, 1977

COSMIC RAY INDICES
(Neutron Monitors)

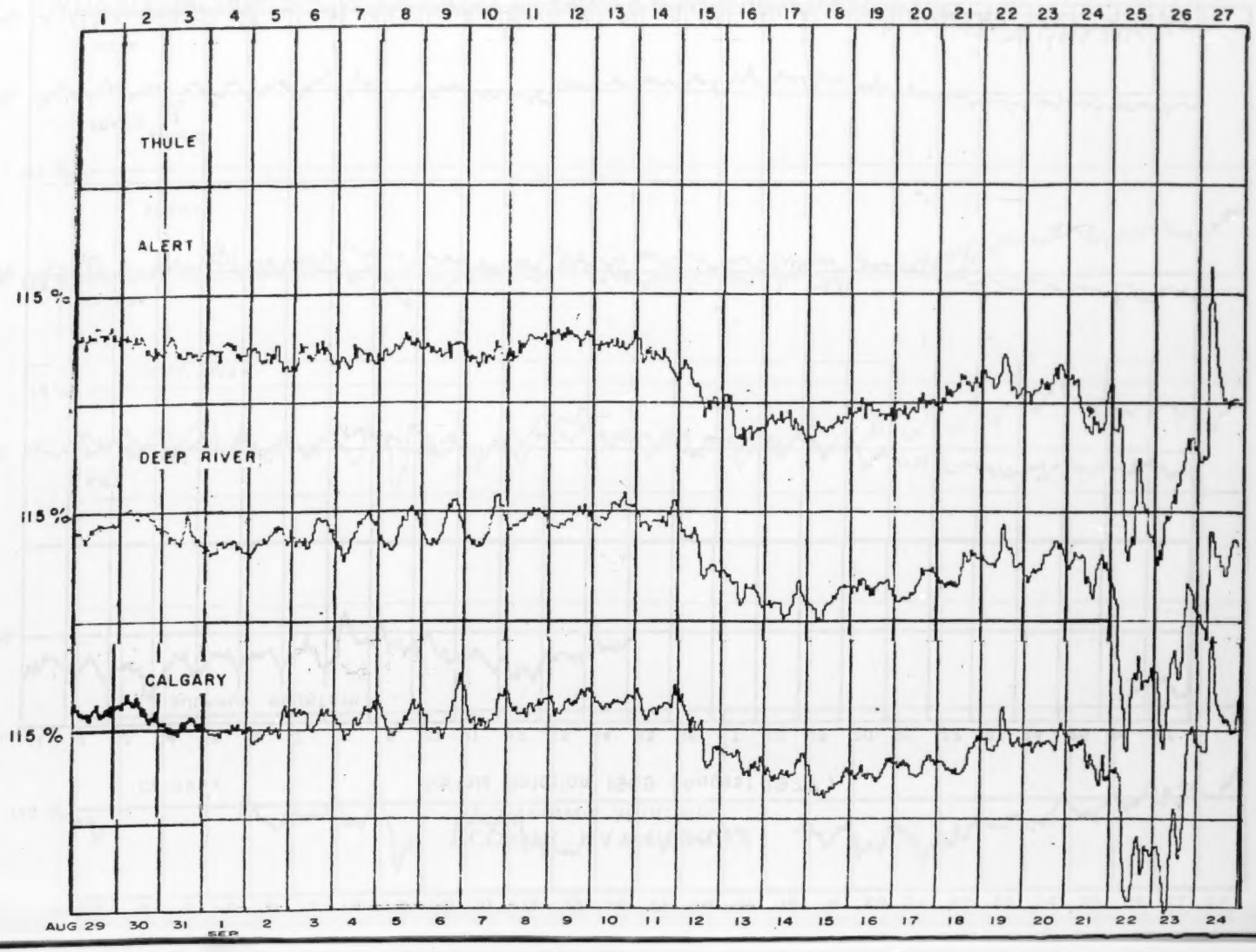
Bartels Rotation 1969 (August 1977)

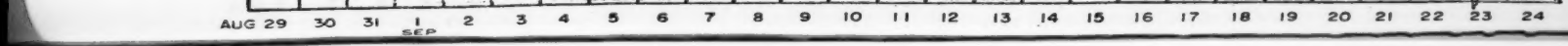


67
Misc
Aug 77

COSMIC RAY INDICES
(Neutron Monitors)

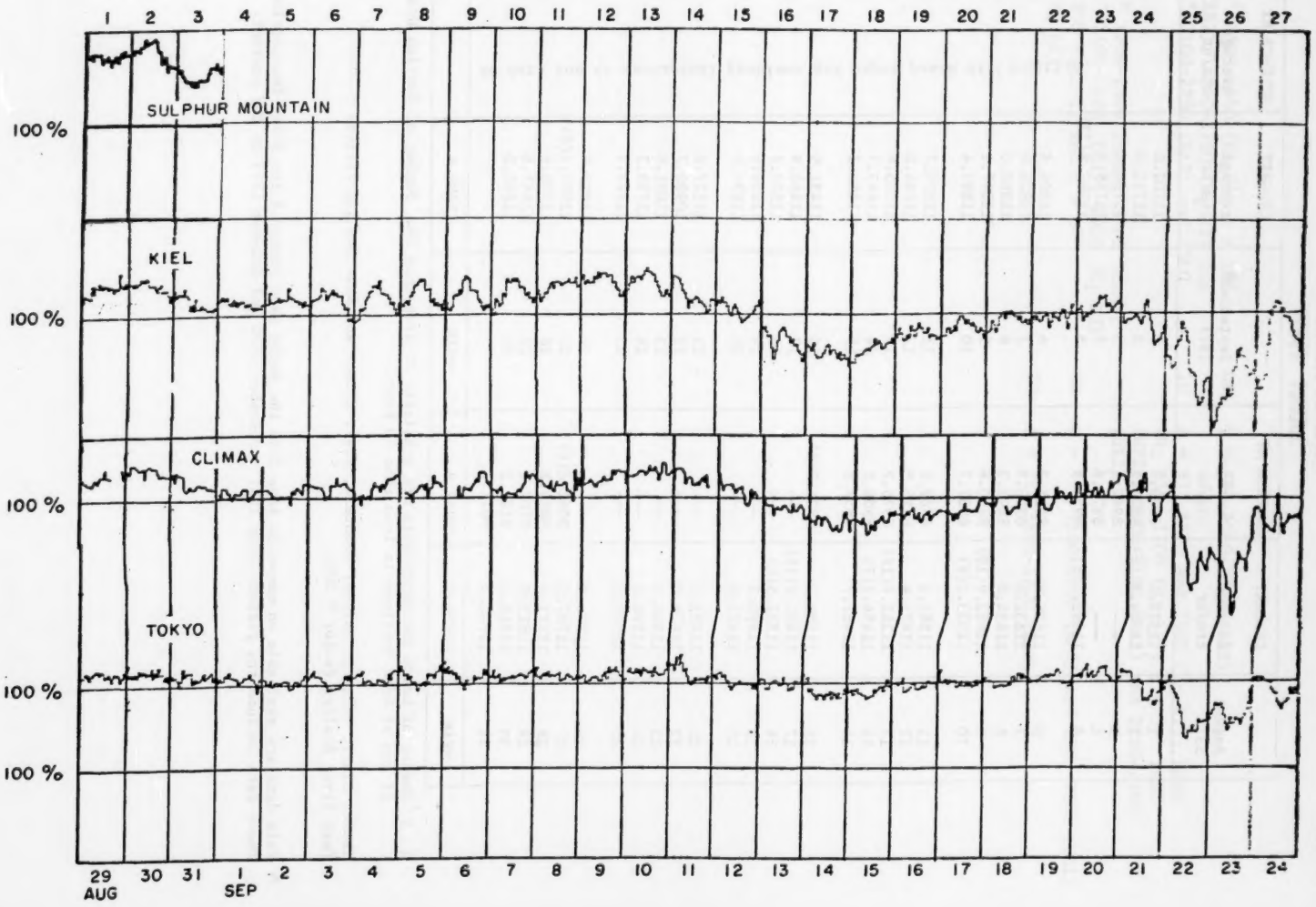
Bartels Rotation 1970 (August - September 1977)





COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1970 (August - September 1977)



69
Misc
Sep 77

COSMIC RAY INDICES

(Neutron Monitors)

AUGUST 1977

August 1977	CALGARY Average cts/hr	SULPHUR MT Average cts/hr	September 1977	CALGARY Average cts/hr	SULPHUR MT Average cts/hr
1	11527.1	8932.7	1	11702.0	
2	11644.3(16)	8921.1	2	11710.8	
3	---	8947.1	3	11798.4	
4	---	8977.6	4	11769.9	
5	11691.7(8)	8954.8	5	11787.8(23)	
6	11626.8	8915.2	6	11804.6	
7	11652.8	8903.6	7	11821.6	
8	11634.8	8892.3	8	11866.0	
9	11462.9(19)	8820.6	9	11897.1	
10	11533.5(9)	8837.7	10	11893.4	
11	11585.1	8869.8	11	11876.7	
12	11473.9	8916.5	12	11696.0	
13	11382.6(16)	8975.2	13	11505.8	
14	11454.2(7)	8906.1	14	11443.7	
15	11462.7	8858.5	15	11352.2	
16	11480.3	8821.3(5)	16	11431.9	
17	11481.8(16)	---	17	11468.9	
18	11532.5(8)	---	18	11502.7	
19	11490.5	---	19	11656.6	
20	11423.8	---	20	11634.8	
21	11423.2	---	21	11527.6	
22	11479.3	---	22	10980.7	
23	11544.5	---	23	11091.8	
24	11596.5	---	24	11799.3	
25	11629.2	---	25	11869.1	
26	11704.8	---	26	11937.4	
27	11707.5	9062.6(6)	27	11922.1(23)	
28	11773.4	9054.2	28	11940.6	
29	11823.9	9102.0	29	11943.8	
30	11846.2	9121.3	30	11898.0	
31	11727.2	9011.7			
MEAN	11579.2	8942.9	MEAN	11684.4	

No data due to mechanical problems and paper punch difficulties.

( ) Number of hours for which data are available if less than 24. Number of Section Hours at Climax if sum of both sections is less than 40 hours.

Thule, Alert, Calgary, Sulphur Mountain, Kiel, Climax and Kula Scaling Factors = 100.
Deep River Scaling Factor = 300.

* Kula data are available on magnetic tape from the World Data Center A for Solar-Terrestrial Physics. These data include the periods July 1967 - December 1970 and October 1975 to the present.

U.S.S.R AURORA

APRIL 1977

06 ϕ = 59° 1500-1600 (HA 2); ϕ = 58° 1700 (RB2), 1900-2100 (R_1 R2) and ϕ = 60° 2100-2200 (HA2) and 2300 (SP2)

07 ϕ = 56° 1200-1300 (HB1), 1800 (HA3); ϕ = 58° 1400-1600 (HA1), 1900 (R_1 R2) 2000-2200 (HA1-2) and ϕ = 57° 2300 (R_2 R3)

08 ϕ = 59° 1500-1800 (SB2)

10 ϕ = 57° 1400 and 1500 (R_2 R1), 1600 (R_2 B1), 1700 (R_2 R2); ϕ = 59° 1900 (HP1), 2000-2100 (HA1) and 2200-2300 (HB1)

16 ϕ = 59° 2100-2200 (HA2) and 2100-2200 (HB1)

20 ϕ = 59° 1600-1700 (HA2)

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